

# AMERICAN GAS ASSOCIATION MONTHLY



Vol. III

No. 11

November, 1921

CARRY back home the message of the Association, stand for it in your community, stand for its success, for the widening of its influence, because in standing for it, you stand for the industry in which you are engaged.

GEORGE B. CORTELYOU

## **Register Early—Be Prompt in Attendance**

You, who will attend the Third Annual Convention, come early to the Registration Desk. You will be promptly served and the annoyance of having to wait will be avoided.

Attend the meetings promptly. Our conventions bring together hundreds of men whose time is valuable. Fifteen minutes delay in starting a session is really the loss of fifteen minutes multiplied by the number of delegates present and as such, it is time well worth saving.

The General Sessions will be started promptly at ten o'clock each morning; the Sectional Sessions promptly at two o'clock each afternoon. Our meetings have been noteworthy in their promptness in starting and the dispatch with which they have been conducted. Please do your part to make them even more so.







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FOR STATEMENTS AND OPINIONS CONTAINED IN PAPERS AND DISCUSSIONS  
APPEARING HEREIN. THE ASSOCIATION DOES NOT HOLD ITSELF RESPONSIBLE

**AMERICAN GAS ASSOCIATION MONTHLY**  
OFFICE OF PUBLICATION, EASTON, PA.  
SUBSCRIPTION RATE **3.00 PER YEAR**

*Entered as Matter of Second Class at the Post Office, Easton, Pa.*  
Acceptance for Mailing at Special Rate of Postage Provided for in section 1103, Act of  
October 3, 1917, Authorized July 16, 1918.

# *American Gas Association Monthly*

Vol. III

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## *Are Your Talents in Circulation?*

Do you realize the importance of what lies beyond your own grimy window-panes? Figuratively speaking, are you cooped up within four walls, or are you where you can look out at the world on the outside?

There is a story of a man who chose for his office a room in the highest building in the city. He was young and afire with enthusiasm. He said he wanted the outlook. From three great windows he could see out over everything that constituted his world and it was all at his feet. He began his career, superior in every way, in energy and in vision. From his windows he could see leagues. He might have become the first in his field, wherever he led his contemporaries might have followed, perhaps into undreamed of efforts.

Then, quite satisfied, he forgot his windows. Dust settled on the panes—and on him. His little bit within four walls snuggled down into itself and the outside was forgotten. The world rushed by and he and his dirty window-panes were submerged in the tumult of its passing.

The American Gas Association represents an endeavor to keep the windows of this industry clean. A good member no matter how self-sufficient he may be must be interested in the outside. The world of commerce is only beginning to realize that to work together is the finest way to work. And by working together, we do not mean, like working with and for like to the utter exclusion of the rest of the earth. When you get right down to it, it really means,—Everybody. We don't take all these days; we don't even keep all we take. We work for our share and we help the next man get his. Consequently, we are all richer. We have the combined treasure of many.

It has been demonstrated, more sufficiently perhaps in this, our own gas industry than in most businesses, that it does not pay to hide one's own little light under a bushel. In dollars and cents, in ideas, in spirit, in the morale that comes from the joy of give and take,—it does not pay! Where is your light?

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## Gas Service Costs In a Rate Structure (Revised)

L. R. DUTTON  
Jenkintown, Pa.

Prepared for the Canadian Gas Association, Montreal, Canada, August 25-26, 1921

### Introduction

**T**HERE is an old adage that "Necessity is the mother of invention," and someone has coined and added a modern adage that "The public utilities mother all industry."

If invention is considered from the viewpoint of the gas man, as the devising of methods of *measurement of or charges for* gas service over the past hundred years; and if the gas industry is accorded its proper recognition among public utilities, surely "Mother" has led an active life.

Necessity created by the economic conditions existing during the preceding five or six years has been productive of more thought and study being devoted to the *costs of service, value of service* and methods of *charges for service* than for a generation previous.

To obtain a proper perspective from which to discuss this subject in a manner that will be the most fruitful in results, to those patient enough to listen, we believe it wise to conduct you on a brief journey of mental sightseeing; on this journey we will witness a few historical facts with respect to the period uses of gas service, the method of measurement and charge for the service from the early days of the industry. (See appendix for extended references.)

### Historical Review

In this review, beginning with the introduction of gas for general lighting, it will be noted that there has been a constant effort to reach a determination of the cost, and apply the charge equitably and justly to the consumer.

Our earliest history relates the first confinement of natural gas in beef blad-

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ders; later this same method was used when gas was generated in an experimental retort. The puncture of a hole in the bladder, and the exertion of pressure thereon followed by the application of a flame at the opening, produced the first gas light.

In the beginning of the gas industry—about 1802—gas was furnished to the premises of the customers through pipes, and used by them through burners or orifices of a given size, and contracted for at a rate for a stipulated number of hours per burner per night. A personal inspector was employed to check up and advise customers when his selected time to retire had arrived and shut off his light.

"It will readily be understood that the contract system was fruitful of complaint and disagreement between the companies and their customers, and that unscrupulous consumers reaped advantages at the expense of the companies and beyond what their more honest neighbors cared to appropriate. In this way the introduction of some method of measurement by automatic and inexpensive means became a matter of pressing necessity."

### First Gas Meter

With the need established, a meter was soon constructed, and about 1815 introduced to customers who desired uninterrupted use of light at night, free from hindrance of inspectors, and who desired to pay for what they used.

"It will be safe to assert that, without the meter, the use of gas would never have attained its present vast development. It is equally true, however, that the gradual extension of gas lighting, due to its excellence, and even from the first, its economy, its cleanliness and the

facility attending its application and employment, rendered the invention of the meter an absolute necessity."

With the introduction of the meter there was established the recognition that there were direct cost elements in furnishing gas service, in contrast to the factory or store making or furnishing a commodity; this led to charge of a meter rental plus a charge for gas.

It is interesting to note by reference to the appendix (No 1—Reference F.) how appropriate were the arguments used by gas men in those early days, compared with present times, when a two-rate system of charging is first introduced, containing a "Service Charge."

### Uniform Meter Rate

The early days of the meter also developed the "*uniform meter rate*" per unit irrespective of quantity used. It should be noted since there was only one use of gas (light) and it was used at only one period (night), it was easier to include all the costs per unit. (Chart A—Curve C.)

A survey of the rate schedules now in use by many companies indicates that they have seen no development that requires them to depart from this character of rate, and in passing we call attention to the fact that here we introduce the first recognition that a charge, based upon the differentials of service, has played an important part in the development of larger gas sales.

### Gas For Fuel

The inventor had been busy, and developed burners to use gas for cooking and heating, and a study of the ability of the gas industry to compete with solid fuels, coupled with the desire of the consumer to use a fuel for comfort in the



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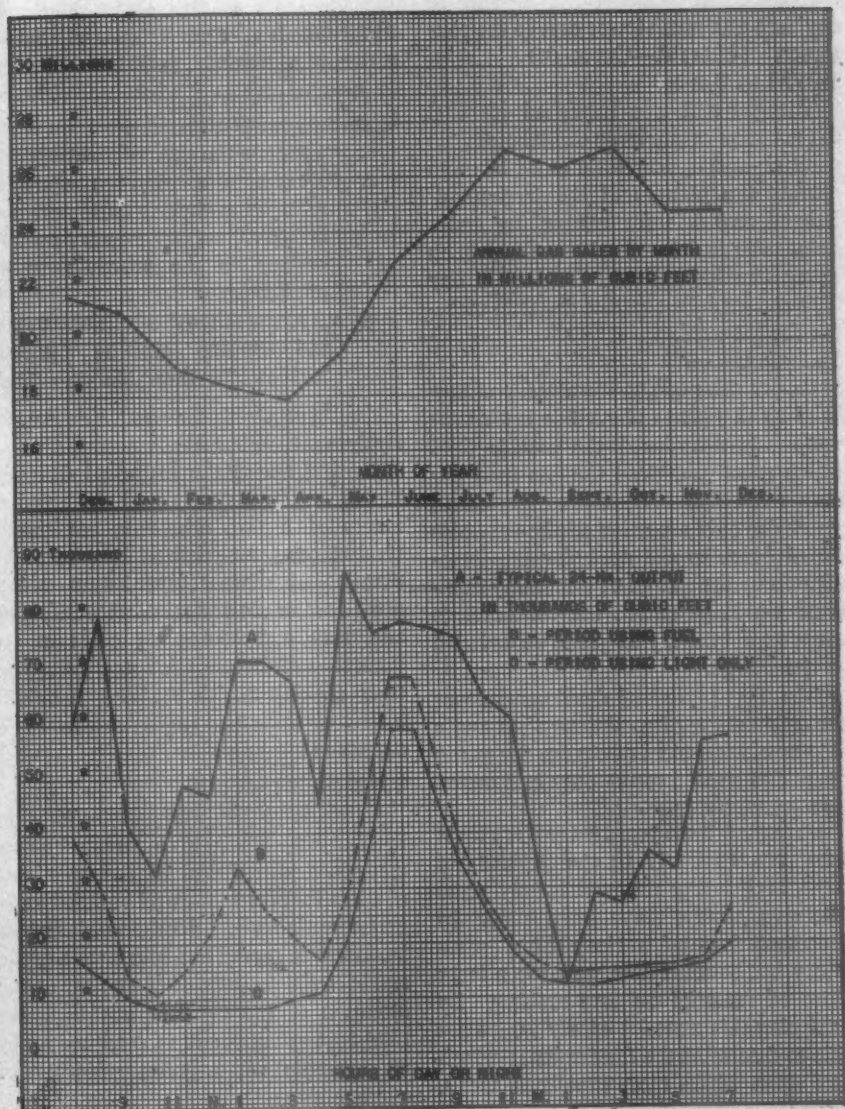


Chart A Gas Output—Day and Year

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warm months of the year, demonstrated that gas could be made and supplied in day time at a much lower cost to the consumer. (Chart A—Curve B.)

### Two Meter System

The gas that was furnished for fuel did not require any large capital outlay in plant or mains, very little more labor to operate the plant, and the largest additional cost was for gas-making materials. It was determined to make a much lower rate for gas sold for fuel in day time and install a separate meter to measure the gas used.

### Minimum Charge

Larger sales of gas were easily stimulated by this plan; about this same time there was introduced the mantle light which greatly reduced the gas used per burner for light. The use of the second meter for only a portion of the year also added force to the need for the introduction of the charge of a monthly minimum which permitted the consumer to use a small quantity of gas to be included in the charge.

The next period of development was the establishing of a minimum bill and a step or block system of charge for gas in quantities used through only one meter.

### Recognizing Fundamentals

During all these years there were those who devoted study to the problem of rates, and during the past twenty years intensive studies have been made by representatives of various State regulatory bodies until now we have a large store of material on rate making. By analyzing this material carefully, we are able to determine the fundamental principles upon which rates should be based.

There is general agreement on certain broad principles involved, and also in the

\*H. R. Ehlers. (See Appendix No. 2)

recognition of the fact that proper rate structures are a large factor in stimulating *increased sales of gas*, as well as furnishing needed *revenues* for the company.

### \*Rate Structure Requirements

1. "Produce the desired revenue.
2. "Distribute the burden equitably among the various customers and do so without unnecessary complications in the schedule or its application.
3. "Recognize local conditions, retain and develop existing business and attract desirable new business.

### Analysis of Detail Cost

Having stated the historical developments of the industry and the requirements of a rate structure, we should remind ourselves that it has been the practice of most companies to devote great care in the system of accounting by analyzing and comparing costs in the various sub-divisions of the company, thus seeking to detect and eliminate losses or increase slight economies in operation.

### Total Cost of Operation

Valuable as this information may be, it does not cover in a comprehensive manner the total cost of the operation, nor can it form a basis of building rates or determining if all or any classes of business are served at a loss or at a profit, and it is the purpose of the writer to call attention to the need of analyzing the total cost of conducting the enterprise by an example of a going company of average size.

### Method of Analysis

An illustration will be presented, ac-

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companied by a series of Charts and Schedules, demonstrating the method by which a complete analysis of any company may be made. From this analysis we will determine the various elements of costs to supply various groups of customers. We will determine the total revenue required, and construct rate schedules that apportion the costs equitably among customers; produce the necessary income and also serve to stimulate and encourage new sources of gas sales.

It is generally recognized and generally agreed to, that an analysis of the costs of gas service will disclose three distinct and definite elements of costs.

A—Customer costs.

B—Demand or capacity costs.

C—Commodity or output costs.

J. M. Spitzglass calls these the three departments for clearing expenses, in the following quotation:

"Perhaps the best method of apportioning the expenses is to imagine the company as being actually divided into three independent departments:

"One: For taking care of the customer's applications, billing, collecting, attending to complaints and the various other items that each customer is liable to require an equal share of attention.

"A second department for taking care of the customer's capacity and for providing the necessary equipment which, for the sake of economy, is provided in a measure to take care of the needs of all the customers collectively with a sufficient allowance for safety.

"The third department for taking care of the manufacture and the delivery of the product for consumption.

"By clearing all accounts through these three departments, the major part of the expenses would naturally classify itself directly under the proper sub-divisions. Certain items would refer to two departments, and some would refer to all three, but these could justly and adequately be pro-rated over the direct expenses of each department."

H. E. Ehlers, in his paper, makes the following analysis of these groups.

### Output Cost

"Included in this group are costs that are practically proportional for cubic feet of gas delivered and that do not vary with the demand of the consumer or with the number of consumers of the company, such as all or a large portion of the costs of production, some of the costs of distribution and the fixed charges, or a portion, depending upon the circumstances of the plant and distribution system.

### Demand Costs

This group includes costs that vary with the demands made upon the system by the consumer and that are not affected directly by the quantity consumed, and that do not vary directly with the number of consumers. In a large measure, these costs are made up of certain portions of the cost of operation and of interest and depreciation charges on a large portion of the property.

### Consumer Costs

This group includes costs that are practically proportional to the number of consumers and that are not affected by variation in the consumption or in the



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demand, such as the cost of reading meters, billing, collecting, etc., maintenance of meters, maintenance of services and the fixed charges thereon, as well as some portion of the miscellaneous office expenses and general expense."

### Charts and Schedules

Before referring to the Charts and Schedules, certain general information should be given to assist in making them more easily understood:

*Schedule I.* Presents in detail the gas used by various groups of customers. This method of analysis furnishes the information that demonstrates the need for recognizing the wide diversity in the hours use of gas for lighting, domestic fuel or industrial purposes; and the necessity of differential rates to apply to these conditions.

*It will be observed that 80 per cent of the customers consume only 30 per cent*

of gas sold, while only 1.6 per cent, representing a few industrial consumers, purchase  $38\frac{1}{3}$  per cent of gas sold. The average use by total consumers is 2600 cu. ft. per month; while 98.4 per cent of consumers use only an average of 1600 cu. ft. per month. It is largely this group of customers who have always been the privileged class in the charge for their service, compared to its cost. A reference to curves on Chart B will serve to emphasize that this condition exists.

Chart A—in the upper section presents a curve showing gas sales by quantities and by months; this curve shows the valley in certain months in the year when more gas should be sold profitably.

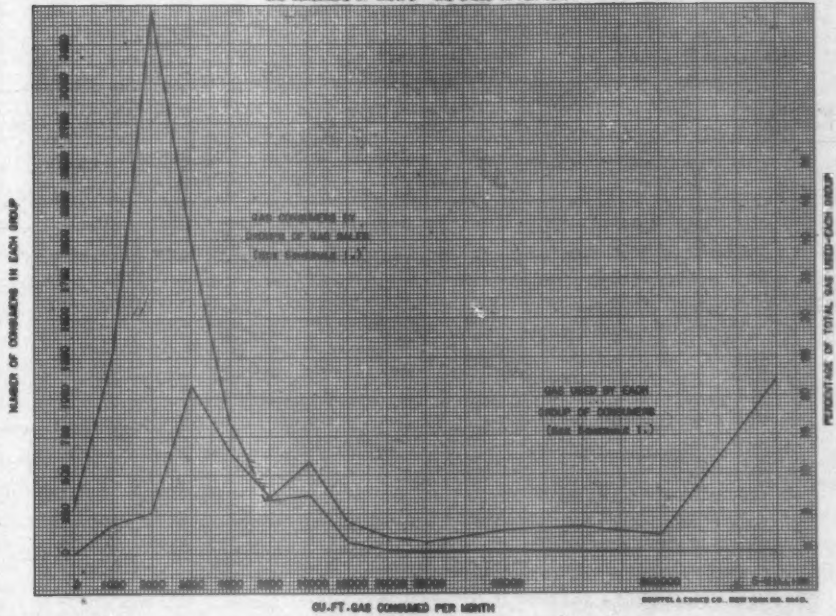
The lower section of the chart (Curve A), shows the actual 24-hour output observed at the station meter, with a peak hour output or demand of 87,700 cubic

SCHEDULE—I  
GAS CONSUMERS' DATA

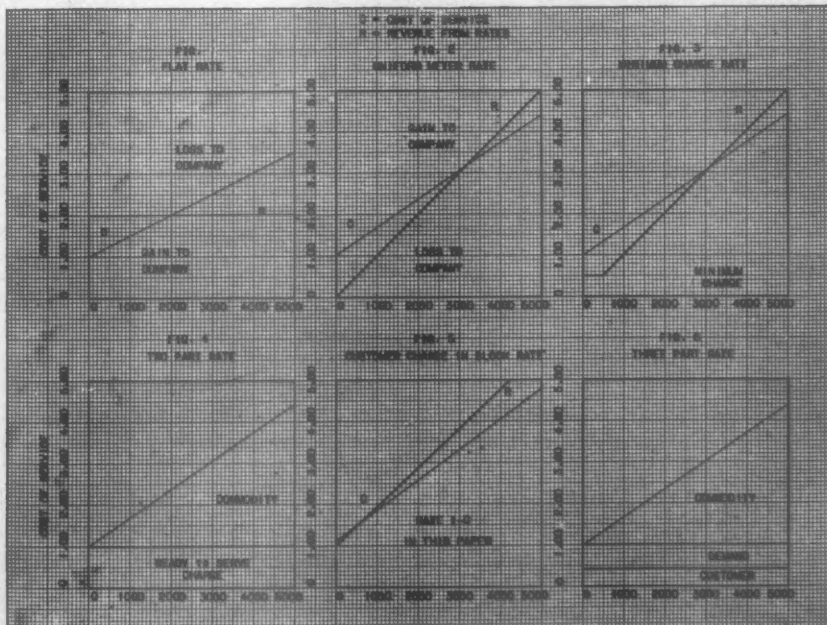
Per cent gas consumed	Annual cu. ft. consumed	Quantities consumed per month	Number of consumers	Groups of consumers	Per cent consumers	Per cent gas consumed
		O Consumed . . .	288			
3.7	10,000,000	Under 1000 cu. ft.	1290			
5.1	14,000,000	1000 to 2000 cu. ft.	3467			
21.6	59,000,000	2000 " 3000 " "	1981	(7016)	80	(30% Gas)
12.8	35,000,000	3000 " 4000 " "	829			
7.0	19,000,000	4000 " 5000 " "	339			
11.7	32,000,000	5000 " 10000 " "	375	8559	98.4	61-2/3 "
4.0	11,000,000	10000 " 15000 " "	72			
2.2	6,000,000	15000 " 20000 " "	22			
1.5	4,000,000	20000 " 25000 " "	14			
2.9	8,000,000	25000 " 40000 " "	18			
3.3	9,000,000	Over 40,000 " "	13			
2.2	6,000,000	1/2 Million " "	1			
22.0	60,000,000	5 " " "	1	141	1.6	38-1/3 "
100	273,000,000	Total	8700	8700	100	100
Average of all consumers—2600 Cu. ft. per month 80% of all consumers use less than average 20% of all consumers use more than average						

# Chart B

GAS CONSUMERS BY GROUPS - GAS SALES IN PER CENT.



# Chart C



\* DIAGRAMS SUGGESTED BY H. E. ENGLISH - PAPER 1918.

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## SCHEDULE II. STATEMENT OF CAPITAL, VALUATION AND RETURN.

Account Number		Value				Per Cent.		
		Commodity	Demand	Customer	Total	Com.	Demand	Cost.
	Intangible Fixed Capital:							
301	Organization		5,000		5,000		100	
302	Franchises							
303	Misc. intangible capital		20,000		20,000		100	
	Total Intang. Fixed Capital		25,000		25,000			
	Tangible Fixed Capital:							
311	Land							
A	Land occupied by gas works		6,000		6,000		100	
B	Land occupied by outside holder stations		8,000		8,000		100	
C	Rights of way						100	
E	General office land		2,500	2,500	5,000		50	50
F	Miscellaneous land devoted to gas operation		2,000		2,000		100	
	Total Landed Capital		18,500	2,500	21,000			
313	Structures							
A	Works and station structures		36,000		36,000		100	
B	Holders		150,000		150,000		100	
C	General office structures		15,000	15,000	30,000		50	50
D	Miscellaneous structures devoted to gas operation		10,000		10,000		100	
	Boiler plant equipment		20,000		20,000		100	
	Steam engines						100	
313	Water gas sets		50,000		50,000		100	
314	Purification apparatus		20,000		20,000		100	
315	Accessory work equipment		30,000		30,000		100	
320	Total Generating Capital		331,000	15,000	346,000			
	Mains		125,000	125,000	250,000		50	50
321	Services		12,750	72,250	85,000		15	85
322	Consumers' meters		11,250	63,750	75,000		15	85
323	Consumers' meters install.		2,625	14,875	17,500		15	85
324	Street lighting equipment			5,000	5,000			100
325	Total Distribution Capital		151,625	200,875	432,500			
327	General equipment							
A	General office equipment		1,000	3,000	4,000		25	75
B	Shop equipment		1,500		1,500		100	
C	Stores equipment		24,000		24,000		100	
D	Transportation equipment		1,250	3,750	5,000		25	75
G	Miscellaneous equipment			1,000	1,000		100	
328	Misc. tangible capital	22,500	11,250	11,250	45,000	50	25	25
	Total General Capital	22,500	39,000	19,000	80,500			
	Total Tangible Capital	22,500	540,125	317,75	880,000			
	Intangible value		25,000		25,000			
	Total Gas Dept. Valuation	22,500	565,125	317,375	905,000			
	Return on valuation at 8%	1,800	45,210	25,390	72,400			

feet, referred to later in our analysis. Curve C is a theoretical curve of gas used for lighting only, with Curve B, a theoretical curve showing time of use of gas for domestic fuel.

*The Classification of Accounting* used is the uniform system of accounts for Gas Corporations, adopted November 12th, 1920, by the National Association of Railway and Utility Commissioners of the United States.

*The Capital Investment*, (Schedule II), represents a cost of about \$3.00 per M cubic feet made, a little under the average investment; is part assumed, and is compiled from experience, to cover the requirements of this example for number of consumers served and gas sales.

*The Operating Costs*, (Schedule III), represent largely actual costs, with parts assumed, to meet the economic condition

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of presenting an example of value for the purpose of this illustration.

*The Summary of Costs*, (Schedule IV), furnishes the totals in dollars in each group, as well as *Commodity* cost in cents, annual *Customer* cost in dollars and *Demand* cost per 100 cu. ft. per year.

The *Commodity* cost per unit is found by dividing the total cost by the quantity of gas sold.

The *Customer* cost is found by dividing the total costs by the average number of customers served.

The *Demand* cost is found by dividing the total cost allocated to the demand column by a sum of the customers' demands.

Demand may be defined as, the greatest quantity of gas that may be called for by all customers during any hour, but which should be observed in 10 or 15 minute periods.

The observed demand, (Chart A—Curve A), was 87,700 cubic feet, and we have assumed, corroborated by good authority,\* that from two to three times the station demand would represent the diversity sum of customers' demands. Experience has shown that it is easy to make a total of the capacity of meters, services or mains, but the diversity of time in customers' use of gas is also to be taken into account.

Using the factor of 2 as a minimum, we have  $2 \times 87,700 = 175,400$  cubic feet; This into the total demand cost equals a fraction less than \$50.00 per year per 100 cubic feet, and we use this sum for our example.

In passing, we should call attention to the fact, that while it has been an open question of the relation of customers' total demand, compared to the observed station demand; there has been developed by H. L. Doherty and Company a demand limiting meter for use both for natural and artificial gas. This form of meter will be an aid not only to the customer in teaching him to diversify his demands for gas, but the company, by its adoption, will know definitely the maximum requirements to be placed on its equipment.

Owing to the fact that gas managers are not accustomed to dealing with close margins of capacity of plant and distribution equipment, compared to customers' demands, sufficient thought has not been devoted to this subject.

From the *Summary of Costs*, (Schedule IV), there is presented the opportunity of applying different forms of rates, to demonstrate the comparative rates that will produce the required revenue.

It will be observed that the analysis of costs enables us to apply either a single or uniform meter rate, a 2-way or customer and commodity rate, a 3-part rate, or a variation of rate forms.

The Single Rate = \$353,210 = 100%

The 2 Part " = 102,520 = 29% Cust.  
250,690 = 71% Com. & Dem.

Total 353,210 = 100%

The 3 Part Rate = \$102,520 = 29% Cust.  
86,885 = 24.6% Dem.  
163,805 = 46.4% Com.

Total 353,210 = 100%

### \*References:

G. H. Cook, Wisconsin Gas Association, 1915 (2 or 3 times demand.)

R. G. Griswold, Pennsylvania Gas Association, 1920 (\$50.00 per year per 100 ft.)

H. D. Hancock, American Gas Institute, 1920 (\$52.00 per year per 100 ft. natural gas.)

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A survey of costs of service by other utilities reveals that all charges are in unit costs of cents, except for gas—*viz.*

Phone	—	Cents per call,
Street Car	—	Cents per ride or zone,
Railroad	—	Cents per mile,
Electricity	—	Cents per K. W. hour,
Water	—	Cents per 1000 gallons,

The writer is convinced that the gas industry has been handicapped in rate matters because of the use of units of 1000 cu. ft. in costs of a dollar or more, and in the schedules suggested, we have adopted units of 100 cu. ft. instead of 1000 cu. ft.

### TYPES OF RATES

#### A — SINGLE RATE OR UNIFORM METER RATE:

273,000,000 cu. ft. @ .13 per 100 cu. ft. ....	\$354,900.00,
Surplus.....	1,690.00
Sum required .....	\$353,210.00

Note: — If rate is  $13\frac{1}{2}\%$  per 100 cu. ft.  
Surplus = \$15,340.00.

#### B — TWO-PART RATE OR CUSTOMER AND COMMODITY RATE:

Customer charge.....	1.00	per month
First 2000 cu. ft. @ .10		per 100 cu. ft.
Next 3000 " " @ .09		per 100 cu. ft.
Next 10000 " " @ $.08\frac{1}{2}$		per 100 cu. ft.
Next 10000 " " @ .08		per 100 cu. ft.
Over 25000 " " @ $.07\frac{1}{2}$		per 100 cu. ft.

Note: — All pre-pay meters at uniform ..... .10 — per 100 cu. ft.

##### Application of Rate

8700 Customers at \$1.00 per mo. = \$12.00 per year.....	\$114,400.00
100,000,000 cu. ft. @ .10 per 100 cu. ft.....	100,000.00
P. P. 33,000,000 " " @ .10 per 100 cu. ft....	33,000.00
80,000,000 " " @ .09 per 100 cu. ft.....	72,000.00
30,000,000 " " @ $.08\frac{1}{2}$ per 100 cu. ft.....	25,500.00
10,000,000 " " @ .08 per 100 cu. ft.....	8,000.00
20,000,000 " " @ $.07\frac{1}{2}$ per 100 cu. ft.....	15,000.00
273,000,000	\$367,900.00
Surplus.....	14,690.00
Sum required.....	350,210.00

C — THREE-PART RATE—In schedule, including two-part block rate for domestic consumers, rate for pre-pay consumers, and could also be sub-divided for short term and rate for municipal use, if desired to add.

*Rate 1-C=Customer cost included in block rate-6667	Consumers use 157 million cu. ft.
" 2-C=Customer cost and flat rate. ....2000	P. P. " " 33 " " "
" 3-C=Three-part rate industrial.....	33 Wholesale " " 83 " " "
Total.....	8700 273 " " "

\*It should be noted rate form 1 C is only a block gas rate, but includes customer cost in first 100 cu. ft. of gas, thus avoiding a 2-part rate, a form which seems not to be favored by consumers.



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### RATE FORM 1-C — BLOCK RATE WHICH INCLUDES CUSTOMER COST IN FIRST 100 CU. FT. OF GAS

6667 Domestic consumers use — 157 million cu. ft. gas  
 First 100 cu. ft. or less @ \$1.00 per month  
 Next 1900 " " ..... @ .10 per 100 cu. ft.  
 All over 23000 " " ..... @ .09½ per 100 cu. ft.

#### RESULT — RATE 1-C:

6667 Consumers plus 6 million cu. ft. @ \$1.00 per mo. =	\$80,004.00
24,000,000 cu. ft. @ .10 per 100 cu. ft. .... =	24,000.00
127,000,000 " " @ .09½ per 100 cu. ft. .... =	120,650.00
Total .....	\$224,654.00

#### RATE FORM 2-C:

2000 P. P. consumers use — 33,000,000 cu. ft. gas  
 Customer charge — \$1.00 per meter per month  
 All gas used, meters set, @ .10 per 100 cu. ft.

#### RESULT — RATE 2-C:

2000 Consumers @ \$12.00 each per year =	\$24,000.00
33,000,000 cu. ft. @ .10 per 100 cu. ft. =	33,000.00
Total .....	\$57,000.00

#### RATE FORM 3-C:

33 Industrial consumers using — 83,000,000 cu. ft. gas  
 Customer charge — \$1.00 per month  
 Demand charge — 50.00 per 100 cu. ft.  
 Commodity charge — .08½ per 100 cu. ft.

#### RESULT — RATE 3-C:

33 Consumers @ \$12.00 each =	\$ 396.00
30,000 cu. ft. @ 50.00 per 100 cu. ft. =	15,000.00
83,000,000 cu. ft. @ .08½ per 100 cu. ft. =	70,550.00
	\$85,946.00

### SUMMARY — RATE C SCHEDULES:

Revenue—rate 1-C =	\$224,654.00
" —rate 2-C =	57,000.00
" —rate 3-C =	85,946.00
	\$367,600.00
Surplus .....	14,190.00
	\$353,210.00

# **SCHEDULE III.** **STATEMENT OF OPERATING EXPENSE ACCOUNTS**

Account Number		Value				Per cent		
		Commodity	Demand	Customer	Total	Com.	Demand	Cust.
701 to 716,								
Inc.	Production expense . . .	158,740			158,740	100		
721.21	Distribution superintendence . . . . .		1,390	1,390	2,780		50	50
721.22	Dist. supplies and expense . . . . .		5,450	5,450	10,900		50	50
21.3	Consumers' premises work . . . . .			3,410	3,410			100
721.4	Removing and resetting meters . . . . .			2,900	2,900			100
722.1	*Maintenance of mains . . . . .		300	300	600		50	50
722.2	Maintenance of services . . . . .			570	570			100
722.3	Miscellaneous distribution maintenance . . . . .		655	655	1,310		50	50
723	Maintenance of consumers' meters . . . . .			4,950	4,950			100
730	Street lighting . . . . .			890	890			100
760	Commercial expenses . . . . .		3,890	11,670	15,560		25	75
770	New business . . . . .		4,080	12,240	16,320		25	75
780	General and miscellaneous expenses . . . . .		5,415	16,245	21,660		25	75
781.26	Store expense: . . . . .							
	Gas works store expense . . . . .	1,500			1,500	100		
	Store expense away from gas works . . . . .			1,500	1,500			100
782	Retirement expense: . . . . .							
	Generating equipment . . . . .		13,700		13,700		100	
	*Street mains . . . . .		5,000	5,000	10,000		50	50
	Meters and services . . . . .			6,400	6,400			100
	Distribution shop . . . . .		30	30	60		50	50
	Miscellaneous . . . . .	340	340	880	1,560	25	25	50
	Taxes . . . . .	1,425	1,425	2,850	5,700	25	25	50
Total		162,005	41,675	77,130	280,810			

\*Allocated to customer and demand, in accordance with the relative cost value of the main system, in terms of the standard, minimum size main. This may vary from 50/50 to 33-1/3 customer and 66-2/3 demand.

## **SCHEDULE IV.** **SUMMARY OF COST ANALYSIS.**

	Commodity Costs			Demand Costs			Customer Costs			Total costs	Per cent
	Total	Per 1000 cu. ft.	Per cent	Total	Per 1000 cu. ft. per yr.	Per cent	Total	Per consumer	Per cent		
Production expenses	152,110	.557	92.9							152,110	43.1
Production maintenance	6,630	.024	4.0							6,630	1.9
Distribution expenses				6,840	3.94	7.88	13,150	1.512	12.8	19,990	5.7
Distribution maintenance				955	.55	1.10	7,365	.846	7.2	8,320	2.3
Commercial expenses				3,890	2.24	4.48	11,670	1.341	11.4	15,560	4.4
New business				4,080	2.34	4.68	12,240	1.407	11.9	16,320	4.6
General & miscellaneous				5,415	3.12	6.24	16,245	1.867	15.8	21,660	6.1
Store expense	1,500	.006	0.9				1,500	.173	1.5	3,000	0.9
Retirement and deprec.	340	.001	0.2	19,070	10.97	21.94	12,110	1.392	11.8	31,520	8.9
Taxes	1,425	.005	0.9	1,425	.82	1.64	2,850	.338	2.8	5,700	1.6
Return on investment	1,800	.007	1.1	45,210	26.02	52.04	25,390	2.918	24.8	72,400	20.5
Total costs	163,505	.600		86,885			102,520	11.784*		353,210	
Total	46.4	.60	100	24.6	50.00	100	29.0	12.00 *	100	100	100

Average No. consumers per year . . . . . 8700  
 Annual sales gas . . . . . 273,000,000 Cu. ft.  
 Unaccounted for 10% . . . . . 27,300,000 " "  
 (Unaccounted-equivalent 300,000 cu. ft. per mile of 3" main per year).

Dollars	Per cent.
Customer cost . . . . . 102,520	29
Demand cost . . . . . 86,885	24.6
Commodity cost . . . . . 163,805	46.4
Total . . . . . 353,210	100

\*Note: \$11.78 is used as \$12.00 in total.



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SCHEDULE V

COMPARISON OF COSTS BY DIFFERENT RATES				
Type A		Type B	Type C	
Gas consumed cubic feet	Uniform meter rate	Customers charge \$1 Block rate	1st 100 cu. ft. Block rate	Cont. char. \$1 Prepay rate \$1
100	.13	\$ 1.10	\$ 1.00	\$ 1.10
200	.26	1.20	1.10	1.30
300	.39	1.30	1.20	1.30
400	.52	1.40	1.30	1.40
500	.65	1.50	1.40	1.50
600	.78	1.60	1.50	1.60
700	.91	1.70	1.60	1.70
800	1.04	1.80	1.70	1.80
900	1.17	1.90	1.80	1.90
1,000	1.30	2.00	1.90	2.00
1,500	1.95	2.50	2.40	2.50
2,000	2.60	3.00	2.90	3.00
2,500	3.25	3.45	3.38	3.50
3,000	3.90	3.90	3.85	4.00
4,000	5.20	4.80	4.80	5.00
5,000	6.50	5.70	5.75	6.00
6,000	7.80	6.55	6.70	7.00
7,000	9.10	7.40	7.65	8.00
8,000	10.40	8.25	8.60	9.00
9,000	11.70	9.10	9.55	10.00
10,000	13.00	9.95	10.50	11.00

### Gas Rates

To the *Gas Industry* is presented the same opportunity as other utilities to apply the principles of *Salesmanship* on a comprehensive scale, by recognizing not only the *Cost of Service*, but also the *Value of Service* to individual groups of consumers.

Wherever the *Electric Industry* has applied rates based on the value of service, or the *Railroads* have adopted tariffs to meet competitive conditions, there has resulted a wonderful growth of service.

The *Gas Industry* must recognize that modern demands for its service can be satisfied if rates are established which recognize that we have passed from the one daily peak of our early history to three or more daily peak periods, and there is much long hour business of low demand, or off peak business that may be developed.

The company that profits by efficiency, produced by rates which stimulate a growth of business, should not be compared with a company that accomplished the same result by high charges for a smaller sphere of service; we should recognize each small surplus over "out of pocket" expense from each class of new customers will lessen the expense to existing customers.

We have previously called notice to the fact of over 50 per cent of customers (Schedule I) use 2,000 cu. ft. or less of gas per month, and are thus in an unprofitable group: Rate Schedule B and I-C are compiled with a reduction in rate after 2,000 cu. ft., to encourage these customers to increase their use of gas and earn a lower rate. Customers using over 25,000 cu. ft. (Rate I-C) have their privilege of choosing the 3-part rate (III-C) at their option.

### Discrimination in Rates

All Regulatory Laws and Commissions created thereunder have had as a basic principle for their creation the removal of discrimination among customers, as to rates and methods of service.

Until the men of the gas industry fully recognize what this means and make some analysis of their rate problem along the lines suggested, they are not taking the required steps to enable them to comply with these laws.

The following in quotation is from Mr. F. C. Freeman:

"It cannot be justly denied that each customer of a public utility should adequately pay for what he gets. If a customer does not pay his just share of the outgo expenditures of a utility, someone else will have to if the utility's income is to equal its outgo. Outgo ex-

penditures shall be considered as including all operating and maintenance expenses, replacement reserve, and fair return on fair valuation. It is manifestly unfair to ask one customer to pay any of the costs of any other customer. It does not require very much study and analyses of the system of gas rates in use to-day by all gas companies, with but few exceptions, to show that the large majority in number of their customers pay less than they should of their share of the outgo expenditures and that the small minority make up the difference by paying more than their share.

"The gas industry is a monopoly, but do not overlook the fact that it is a gas monopoly, and is not a fuel and lighting monopoly. It is important to keep this fact clearly in mind.

"If a customer will not pay his just share of the costs which he has caused, he must be able to obtain a like and similar service for fuel or lighting from some other source at a lower cost. This applies to the large customer as well as it does to the small customer. Coal, coke, oil and electricity are in active competition in all phases of the gas industry. It is, therefore, highly important that gas rates should be formed on an equitable basis for all classes of customers if the industry is to maintain itself and grow as is demanded of it by its economic position in the welfare of society.

"Rates should be—

Just  
Reasonable  
Sufficient  
Non-discriminatory and  
Non-preferential

"A reasonable and just rate is one that is just both to the utility and to the customer.

"It must be sufficient in that the income will at least equal the outgo.

"It must be reasonable in that the items of outgo are fair and warranted for the circumstances and conditions under which the utility operates.

"It must be sufficient to encourage additional investment in the service of the public.

"A rate must not be preferential or unjustly discriminatory by being greater or less than that charged any other person for a like and contemporaneous service. A rate must not be unjustly discriminatory by requiring a certain class or classes of customers to pay for the costs caused by another class or classes."

#### Conclusion

In the rate structure proposed by the writer, due recognition has been given to all the above requirements of an ideal rate. It will be noted that different rate structures are proposed to comply with the conditions demanded by different classes of customers or the quantity required by them.

It is recognized that there should be no statutory law and certainly no moral law that requires the serving of any class of customers at less than the cost of that service. Since there can be almost definite determination of the exact costs entering into the various classes of service to customers, it is suggested that each company make an analysis of its cost of the service. After determining the cost to each class, it will be comparatively easy to build a rate structure for each class. This in turn will lead to stimu-

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lating and developing increased sales for the company. Mr. Freeman also states:

"If we expect to hold the customers we have; if we expect to increase the sales to the new customers we have; if we expect to secure new business in the face of coke, oil and electricity, and other competition; if we expect to live and grow and best serve the public welfare, it is imperative that we at once become familiar with and install a proper rate structure.

"The sun of the gas industry is just rising, but to those of us who will not be keenly alive to the situation it has practically set."

### APPENDIX No. 1

A—Gas Consumers' Guide, Page 21. Wm. Richards, 1866.

"When lighting by gas was first introduced, consumers were supplied by contract—that is, a certain sum per annum was charged for each of the various classes of burners, to be lighted from sunset to a specified hour. This system was accompanied with serious loss to companies, who, having no means of shutting off the supply at the hour stipulated, the gas was left entirely at the discretion of the consumer, and the result was continued with serious loss. A much better system was adopted in France, where it was the custom to attach a tap to the supply pipe of every house, which was opened and shut by an employee of the company precisely at the time contracted for, thus avoiding part of the loss occasioned by the less scrupulous class of the community. The system now universally adopted is to supply gas only by meter, which is alike advantageous to companies and consumers, and is the only equitable way that it can be employed."

B—From King's Treatise on Manufacture and Distribution of Coal Gas. Chapter I. 1878.

"Before the invention of the meter the quantity and cost of the gas supplied to the public were estimated by the number of hours it was consumed through burners of a given size, inspectors being appointed to go the round of the several districts at stipulated hours of the night, to see that the lights were duly extinguished according to contract. When the light was seen to be burning beyond the prescribed hour in any premises, the inspector announced his visit by striking an iron rod which he carried, or, if this was ineffectual, by a loud rap at the door of the consumer, and this was usually the signal for a general extinguishment, resort being then had to the dim and imperfect light of the candle or oil lamps as they then existed; and when these warnings were of no effect, it was the inspector's duty to close the tap attached to the service pipe in the street outside.

"It will readily be understood that the contract system was fruitful of complaint and disagreement between the companies and their customers, and that unscrupulous consumers reaped advantages at the expense of the companies, and beyond what their more honest neighbors care to appropriate. In this way the introduction of some method of measurement by automatic and inexpensive means became a matter of pressing necessity; but even after the invention of the meter, for many years the system of allowing private consumers to burn by contract was continued to a greater or less extent. The adoption of the meter was even discouraged by some companies, so difficult is it to move some minds out of the rut

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in which they have been accustomed to travel."

C—From *Theory and Practice of Gas Lighting*. By T. S. Peckston, Civil Engineer. 1823.

### 'First Gas Meter'

"The idea of selling the gas by measure, instead of the very inaccurate method of disposing thereof by the time of burning and size of burner, seems to have originated with the Chartered Gas Light Company in the year 1815; for, in the latter end of that year, or very early in the ensuing one, Mr. Samuel Clegg, who was at that time its engineer, constructed a gas meter of the following description: To a wooden frame were attached two small cylindrical vessels, in which worked two gas holders, each containing, we will say, for the sake of speaking of a specific quantity, one cubic foot.

"Mr. Clegg next attempted to make a gas meter having a rotary motion instead of a vertical one. It consisted of a cylinder divided into several chambers, revolving on a hollow axis, enclosed in another which served as its case. For this meter he obtained a patent, the specifications of which are given in the thirtieth volume of the *Repertory of Arts*, second series,\* to which the reader is referred for its description. It is probable he will find some difficulty in understanding its action, for, perhaps, for a thing which we shall in due time find performed by a method exceedingly simple, and beautifully mechanical, nothing of a more complicated nature could have been thought of."

\*Nos. 176 and 177, for January and February, 1817.

D—From *A Practical Treatise on the Manufacture and Distribution of Coal Gas*. By William Richards, C.E. 1877.

### Gas Meters

"About 1840 the Chartered Company began to understand the great importance of the instruments in question, and by their directors it was resolved that meters should be introduced to the exclusion of contract burning, or, as it may now be necessary to explain, the system of charging a certain sum per annum for each light upon the premises, as universally adopted before the introduction of the meter. This resolution met with the strongest opposition from consumers; and subsequently, when it was decided that the supply would be discontinued if not furnished by this means, many submitted for a time to that alternative rather than admit the "mystery box," as it was sometimes called, into their premises.

"And it must be admitted when all the circumstances are considered, that there was some excuse for this prejudice, for the action of the instrument itself, measuring constantly and silently, a subtle fluid like gas, was to many no doubt mysterious. Moreover, a most imperfect surveillance had previously been observed with respect to contract consumers, who frequently burned three or four times the quantity of gas they were entitled to, which by the meter was, however, corrected, when for want of a better means of explanation, the extra charge was attributed to a system of jugglery, of which, by some consumers, gas inspectors were considered adepts.

"In France the meter was legalized as a measure in 1846, when the government made the necessary stipulation as to

range or variation from the correct measurement, and the other rules to be observed in the construction of these instruments. A few years afterwards most of the continental countries adopted similar steps."

**E—From Instructions for the Management of Gas Works.** By W. C. Holmes & Co., Engineers and Contractors for Gas Works, Whitestone Iron-works, Huddersfield, Eng. 1874.

**"Gas Meter Rental System"**

"In all cases gas companies will find it to be to their advantage to provide the meters for consumers at a fixed rental, which will repay them for the outlay and for repairs, the usual rate of charge being 10 per cent on the cost, including fixing. This gives them the right to remove any meter which they may suspect to be incorrect in its registrations, or too small for the amount of gas consumed, and to fix another in its place. Cases often occur where a meter put down to supply, say ten lights is expected to pass sufficient gas for thirty or more lights."

**F—The American Gas-Light Journal.** Volume 1, No. 3, Thur., Sept. 1, 1859.

**"The Wrongs of Gas Consumers"**

"The first and greatest source of complaint on the part of consumers is the charging a rent for the gas meters, on the ground that it would be quite as just and reasonable for the dealer in dry goods, groceries or liquors to charge for the use of his measure in supplying those commodities.

"But the cases are not analagous. The dealers in those articles measure their commodities at their own counters; one measure answers for all, and the cost is trifling. Not so with gas companies; they must have a measure for each cus-

must keep it in order at all times. The meters in use in this city alone have cost some half million dollars. If the grocer had to furnish each customer with a complete set of weights and measures, and to leave them in that customer's house, he would expect to be paid such a sum as would be equivalent to an interest on their cost, and the expenses of ordinary wear and tear. The business of a gas light company is emphatically a retail business. It is true they might (as some companies do) charge such a price for the gas as would cover the use of the meter, the cost of keeping it in order, and replacing it when worn out; but this plan would not be as equitable as the present one, and for the following reasons: The meter is often much larger than is requisite for the ordinary consumption, for it must be of sufficient capacity to supply all the gas that may be required, when- ever, on special occasions, all the burners are lighted. This may be but once in a year, perhaps but once in several years. In stores, in workshops, and in some few dwellings, the meters are of such sizes only as are sufficient for the daily wants of those to whom they are furnished. In our public markets, and in many private butcher shops, gas is burned only on Saturday nights, and in some offices and public rooms and buildings it is but seldom used. There does not, therefore, exist any relative proportion between the size and consequent cost of the meter and the amount of gas consumed, yet every- one must have a meter large enough to give him all the gas he may desire, and at any time, when his business or pleasure may require it.

"Gas companies charge, therefore, for the gas according to the quantity con-



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sumed, and for the meter a rent proportionate to its cost. Some of the English companies do not furnish meters, but compel customers to purchase them of the manufacturers. During the past year the citizens of London have petitioned Parliament to compel the companies to supply the meters and to charge a rental for their use; and the charters last granted contain clauses requiring the companies to furnish meters, and specifying the rent—following, as nearly as may be, the course which ours have found to be the most just and reasonable. Our gas companies have, in a few instances, sold meters, and would gladly do so now, but for the trouble to which they are subjected whenever one needs to be repaired. If every customer would find his own meter, and keep it in order, it would be of great relief to the companies; but when a meter needs repair, it often happens that it costs as much as it is worth, while the owner can be rarely convinced that such is the case; and the companies are compelled to lend him one until his own is returned, or leave him in darkness. An experience of some twenty-two years has proved that our present system is the best, because it is the most convenient to the public, and the most equitable."

### APPENDIX No. 2

#### Principles of Rate Making or Allotting Costs

##### Recent Papers

- 1916—Report of the Differential Rates Committee, National Commercial Gas Association.

- 1916—Proceedings of the Pacific Coast Gas Association—  
Paper by W. G. Vincent, Jr.—Analyzing Gas Costs and Sales.  
Paper by J. M. Spitzglass—Where We Stand in Rate Making.  
1918—Paper by S. S. Wyer—Elimination of Discrimination in Utility Rates by Ready to Serve Charges.  
1919—Paper by H. L. Doherty—Address Before the Public Utility Commission of Kansas.  
1920—Paper by R. G. Griswold, Pennsylvania Gas Association, Doherty Method of Charging for Gas.  
1920—Paper by H. E. Ehlers, Pennsylvania Gas Association, Some Factors in Rate Making.  
1920—Report of the Bureau of Standards, Washington Gas Light Company Case.  
1920—Paper by F. C. Freeman—Analysis of Costs Applicable to Service Charge.  
1921—Paper by F. C. Freeman, New England Association of Gas Engineers—Principles of Gas Rate Making.  
1921—Paper by W. L. Ransom, Empire State Gas and Electric Association—The Service Charge as Part of a Rate.

##### Other References of Value

- 1891—Paper by Walton Clark, American Gas Light Association.  
1893—Paper by A. E. Forstall, American Gas Light Association.  
1900—Paper by H. L. Doherty, National Electric Light Association.  
1904—Paper by F. W. Frueauff, American Gas Light Association.  
1905—Paper by A. E. Forstall, American Gas Light Association.  
1906—Paper by W. H. Gardiner, Western Gas Association.  
1910—Paper by H. L. Doherty, National Electric Light Association.  
1913—Paper by A. S. Miller, American Gas Institute.  
1915—Paper by J. H. Maxon, Indiana Gas Association.  
1915—Paper by G. H. Cook, Wisconsin Gas Association.



## Nominating Committee Reports

The Committees appointed for the purpose of selecting candidates for the offices of Chairman and Vice Chairman of the various Sections submit the following unanimous reports:

### ACCOUNTING SECTION.

For Chairman, Ewald Haase, Milwaukee Gas Lt. Co., Milwaukee, Wisconsin.

For Vice Chairman, J. W. Heins, United Gas Improvement Co., Philadelphia, Pa.

(Signed) W. A. DOERING, *Chairman.*

F. M. JAMES,

E. C. SCOBELL,

### ADVERTISING SECTION.

No report as yet.

### COMMERCIAL SECTION.

No report as yet.

### MANUFACTURERS' SECTION.

For Chairman, John J. DeHart, Jr., The Isbell-Porter Company, Newark, New Jersey.

For Vice Chairman, Frank A. Lemke, The Humphrey Company, Div., Kalamazoo, Michigan.

(Signed) H. D. SCHALL, *Chairman.*

W. H. JEFFERSON,

F. A. LEMKE,

### TECHNICAL SECTION.

For Chairman, C. N. Chubb, Gen. Mgr., Tri-City Railway & Light Co., Davenport, Iowa.

For Vice Chairman, F. C. Weber, Gas Engineer, H. L. Doherty Co., New York, N. Y.

(Signed) L. R. DUTTON, *Chairman.*

J. B. KLUMPF,

B. F. LYONS.



# A. G. A. Convention Program

## GENERAL SESSIONS

GOLD ROOM—MEZZANINE FLOOR—CONGRESS HOTEL

*Wednesday Morning, November 9, Ten O'clock*

- Meeting Called to Order and Opening Remarks .....  
.....Charles A. Munroe, President, The Peoples Gas Light & Coke Co., Chicago, Ill.
- Report of Secretary-Manager, Oscar H. Fogg, American Gas Association, New York, N. Y.
- Election of Active Members .....
- Report of Treasurer .....H. M. Brundage, Consolidated Gas Co., New York, N. Y.
- Address of the President .....  
.....Charles A. Munroe, The Peoples Gas Light & Coke Co., Chicago, Ill.
- Report of Nominating Committee and Election of Officers .....  
.....C. L. Holman, Chairman, Laclede Gas Light Co., St. Louis, Mo.
- Report of Time and Place Committee .....  
.....Burton Smart, Chairman, Portland Gas Light Co., Portland, Me.
- Address "Merchandising Problems in the Gas Industry" .....  
..... (Presented for the Manufacturers' Section.)  
Charles Coolidge Parlin, Manager, Division of Commercial Research, Advertising  
Dept., The Curtis Publishing Co., Philadelphia, Pa.
- Reports of General Committees .....
- Accident Prevention.....Chas. B. Scott, Chairman, Bureau of Safety, Chicago, Ill.
- Consideration of Existing Methods of Charging for Gas in Terms Other than  
Per Thousand Cubic Feet .....  
.....H. C. Abell, Chairman, American Light & Traction Co., New York, N. Y.
- Membership in Chamber of Commerce of the United States of America.....  
.....Geo. B. Cortelyou, National Councillor, Consolidated Gas Co., New York, N. Y.
- Representation on American Engineering Standards Committee .....  
.....A. H. Hall, Chairman, Central Union Gas Co., New York, N. Y.
- Standard Gas Appliance Specifications .....  
.....W. T. Rasch, Chairman, Consolidated Gas Co., New York, N. Y.

## EXECUTIVE SESSION

(Only Company Member Delegates Eligible to Attend)

- Election of Company Members.
- Election of Directors.
- Election of 1922 Nominating Committee.
- Election of Committee on Resolutions.
- Thursday Morning, November 10, Ten O'clock*
- Address—"Marketing Gas Securities Locally" .....  
.....R. M. Searle, President, Rochester Gas & Electric Corp., Rochester, N. Y.
- Address by A. C. Bedford, Chairman of the Board of Directors, Standard Oil Company.
- Why Should Gas Companies Sell their Tar to Distillers Instead of Working It Themselves?  
(Presented for the Technical Section.) R. P. Perry, Vice President, The  
Barrett Co., New York, N. Y.
- Friday Morning, November 11, Ten O'clock*
- Address—"The Gas Industry's Biggest Task" .....  
..... (Presented for the Publicity and Advertising Section.)  
Samuel Insull, Chairman Board of Directors, Peoples Gas, Light & Coke Co., Chi-  
cago, Ill.
- Report of Committee on Customers' Service. (Presented for the Commercial Section.)  
.....J. B. Myers, The United Gas Improvement Co., Philadelphia, Pa.
- Preparation and Presentation of Rate Cases before Commissions .....  
..... (Presented for the Accounting Section.) Wm. G. Woolfolk, Chicago, Ill.

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### ACCOUNTING SECTION SESSIONS

BALL ROOM—FIRST FLOOR—AUDITORIUM HOTEL

*Wednesday Afternoon, November 9, Two O'clock*

- Opening Remarks and Report of Chairman .....  
.....W. H. Pettes, Public Service Gas Co., Newark, N. J.  
Report of Nominating Committee and Election of Officers .....  
.....W. A. Doering, Boston Consolidated Gas Co., Boston, Mass.  
Paper—"Soul of Service" .....  
.....W. H. Rogers, Division Agent, Public Service Gas Company, Paterson, N. J.  
Report of Committee on Fire Insurance Rates.....  
.....E. C. Scobell, Rochester Gas & Electric Corp., Rochester, N. Y.  
Report of Committee on Standard Classification of Accounts .....  
.....W. J. Meyers, Consolidated Gas Co., New York, N. Y.  
Report of Committee on Uniform Accounting Nomenclature .....  
.....W. A. Sauer, Chairman, The Peoples Gas Light & Coke Co., Chicago, Ill.

*Thursday Afternoon, November 10, Two O'clock*

- Address—"Federal Income Tax as Applied to Gas Companies" .....  
.....H. W. Forbes, Shearman and Sterling, New York, N. Y.  
Report of Committee on Continuous Inventory of Fixed Capital .....  
.....Ernest Johnston, Syracuse Lighting Co., Syracuse, N. Y.  
Paper—"The Importance of the Accounting Department under Commission Regulation  
.....De Witt Clinton, Worcester Gas Light Co., Worcester, Mass.  
Paper—"Form of Monthly Production Statement" .....  
.....H. T. Hughes, Denver Gas & Electric Light Co., Denver, Colo.  
Report of Committee on Job Order Systems .....  
.....F. M. James, Western United Gas & Electric Co., Aurora, Ill.  
Report of Committee on State Representatives .....  
.....Ewald Haase, Milwaukee Gas Light Co., Milwaukee, Wis.

*Friday Afternoon, November 11, Two O'clock*

Open Forum—for the discussion of:

- (a) General accounting subjects of interest to members or problems they are confronted with in their work.
- (b) Subjects to be included in the Accounting Section program for 1921-1922.

### COMMERCIAL SECTION SESSIONS

GOLD ROOM—MEZZANINE FLOOR—CONGRESS HOTEL

*Wednesday Afternoon, November 9, Two O'clock*

- Opening Remarks and Report of Chairman .....  
.....H. S. Schutt, C. H. Geist Co., Philadelphia, Pa.  
Report of Nominating Committee and Election of Officers .....  
J. D. Shattuck, Chairman, Philadelphia Suburban Gas & Electric Co., Chester, Pa.  
Report of Merchandising Committee .....  
.....H. J. Long, Chairman, The Kompak Company, New Brunswick, N. J.  
Report of Rate Structure Committee.....  
J. D. Shattuck, Chairman, Philadelphia Suburban Gas & Electric Co., Chester, Pa.  
Paper—"Gas Fired Hot Water Systems and their Applications" .....  
.....A. A. Schuetz, Industrial Engineer, Milwaukee Gas Light Co., Milwaukee, Wis.

## A. G. A. MONTHLY

*Thursday Afternoon, November 10, Two O'clock*  
(Joint Session with Publicity and Advertising Section)

- Opening Remarks and Report of Chairman .....  
.....M. C. Robbins, The Gas Age-Record, New York, N. Y.  
Report of Nominating Committee and Election of Officers .....  
.....J. P. Hanlan, Public Service Gas Co., Newark, N. J.  
Paper—"What Advertising Did for One Small Town Gas Man" .....  
.....Carl B. Wyckoff, Manager, Emporia Gas Co., Emporia, Kan.  
Paper—"The Status of Advertising in the Gas Industry" .....  
.....C. W. Person, American Gas Association, 130 East 15th St., New York, N. Y.  
Report of Industrial Fuel Sales Committee .....  
.....H. O. Loebell, Chairman, H. L. Doherty & Co., New York, N. Y.

*Friday Afternoon, November 11, Two O'clock*

- Paper—"How to Give Better Service with Less Gas" .....  
.....S. S. Wyer, Consulting Engineer, Columbus, Ohio.  
Report of Industrial Fuel Contracts Committee .....  
.....Chas. S. Smith, Chairman, American Gas Co., Philadelphia, Pa.  
Report of Gas Lighting Committee .....  
.....F. R. Barnitz, Chairman, Consolidated Gas Co., New York, N. Y.  
Report of Heating Committee .....  
.....G. E. Bennitt, Chairman, Consolidated Gas Co., New York, N. Y.

### \* MANUFACTURERS SECTION SESSION GOLD ROOM—MEZZANINE FLOOR—CONGRESS HOTEL *Monday Morning, November 7, 10:30 O'clock*

- Address of Chairman .....Geo. S. Barrows, Grinnell Co., Providence, R. I.  
Report of Secretary.....P. H. Hall, American Gas Association, New York, N. Y.  
Report of Nominating Committee.....H. D. Schall, Detroit Stove Works, Detroit, Mich.  
Election of Chairman and Vice-Chairman.  
Introduction of New Officers.  
New Business.  
Adjournment.

### TECHNICAL SECTION SESSIONS BANQUET HALL—NINTH FLOOR—AUDITORIUM HOTEL *Wednesday Afternoon, November 9, Two O'clock*

- Opening Remarks and Report of Chairman .....  
.....R. B. Harper, The Peoples Gas Light & Coke Co., Chicago, Ill.  
Report of Nominating Committee and Election of Officers .....  
.....L. R. Dutton, Philadelphia Suburban Gas & Electric Co., Jenkintown, Pa.  
Paper—"What Goes on in a Water Gas Machine"? .....  
.....M. E. Benesh, The Peoples Gas Light & Coke Co., Chicago, Ill.  
Report of Committee on Complete Gasification of Coal.....  
.....A. W. Warner, Chairman, Philadelphia Suburban Gas & Electric Co., Chester, Pa.  
Report of Gas Oil Committee .....  
.....W. H. Fulweiler, The United Gas Improvement Co., Philadelphia, Pa.  
Report of Refractory Materials Committee .....  
.....W. H. Fulweiler, Chairman, The U. G. I. Company, Philadelphia, Pa.

## A. G. A. MONTHLY

Thursday Afternoon, November 10, Two O'clock

(Parallel Distribution Session—BANQUET HALL—9TH FLOOR)

- Report of Committee on Increasing Distribution Capacity .....  
.....C. N. Chubb, Chairman, United Light & Railways Co., Davenport, Iowa.  
Paper—"Utilization of Compressed Air for Clearing Gas Piping" .....  
.....J. T. Griffin, Consolidated Gas, Electric Light & Power Co., Baltimore, Md.  
Report of Committee on Consumers Meters .....  
.....J. A. Clark, Jr., Public Service Gas Co., Newark, N. J.  
Report of Cast Iron Pipe Standards Committee .....  
.....Walton Forstall, The United Gas Improvement Co., Philadelphia, Pa.

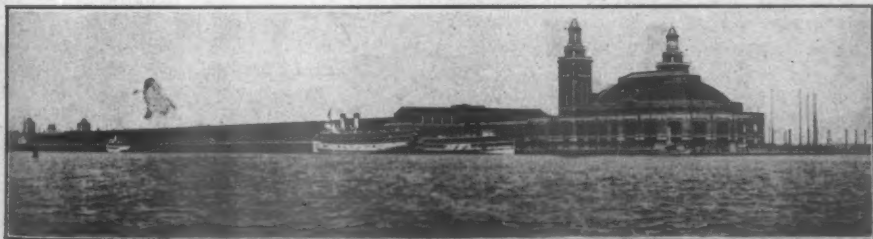
*Thursday Afternoon, November 10, Two O'clock*

(Parallel Chemical Session—9th Floor)

- |                                                                                                     |                                                                      |
|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| Report of Chemical Committee, . . . . .                                                             | C. A. Lunn, The Consolidated Gas Co., New York, N. Y.                |
| Report of Purification Committee . . . . .                                                          |                                                                      |
| .....                                                                                               | A. C. Fieldner, Chairman, Bureau of Mines, Pittsburgh, Pa.           |
| "The Effect of Moisture on the Activity and Capacity of Iron Oxides for Gas Purification" . . . . . | Wm. A. Dunkley, U. S. Bureau of Mines, Urbana, Ill.                  |
| "The Seaboard Liquid Process for Gas Purification" . . . . .                                        |                                                                      |
| .....                                                                                               | F. W. Sperr, Jr., The Koppers Co., Pittsburgh, Pa.                   |
| "Determination of Hydrogen Sulphide in Illuminating Gas" . . . . .                                  |                                                                      |
| .....                                                                                               | C. W. Jordan, The United Gas Improvement Co., Philadelphia, Pa., and |
| .....                                                                                               | W. H. Fulweiler, The United Gas Improvement Co., Philadelphia, Pa.   |

*Friday Afternoon, November 11, Two O'clock*

- |                                                                                      |                                                                                  |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Paper—"Some Experiments with the Mixing of Different Gravity Gases in Holders" ..... | H. E. Bates, The Peoples Gas Light & Coke Co., Chicago, Ill.                     |
| Report of Committee on Deposits in Gas Pipes and Meters .....                        | O. A. Morhous, The Consolidated Gas Co., Astoria, L. I., N. Y.                   |
| Report of Carbonization Committee.....                                               | J. Hawley Taussig, Chairman, The U. G. I. Contracting Company, Philadelphia, Pa. |
| Report of Committee on Disposal of Waste from Gas Plants .....                       | F. W. Sperr, Jr., The Koppers Co., Pittsburgh, Pa.                               |



## Chicago's Municipal Pier

## Exhibition Spaces Allotted

The notice of space allotments was mailed to all exhibitors on August 4.

Elizabethan Room (demonstrating their product with gas connection).

Exhibitors will be found in the following locations:

1. Welsbach Company, Gloucester, N. J.
  2. Welsbach Company, Gloucester, N. J.
  3. G. F. Schmidt, Chicago, Ill.
  4. Century Stove & Mfg. Co., Johnstown, Pa.
  5. American Radiator Co., Chicago, Ill.
  6. Weir Stove Co., Taunton, Mass.
  7. Milwaukee Gas Specialty Co., Milwaukee, Wis.
  8. Kennedy-Toombs Co. Inc., New York, N. Y.
  9. Quick Meal Stove Co. Div., St. Louis, Mo.
  10. The Kompak Co., New Brunswick, N. J.
  11. The Crandall Pettee Co., New York, N. Y.
  12. The J. H. Grayson Mfg. Co., Athens, O.
  13. The Cutler-Hammer Mfg. Co., Milwaukee, Wis.
  14. James B. Clow & Sons, Chicago, Ill.
  15. Claus Automatic Gas Cock Co., Milwaukee, Wis.
  16. A. H. Wolff Gas Radiator Co., New York, N. Y.
  17. The Scott Gas Appliance Co., Washington, D. C.
  18. General Gas Light Co., New York, N. Y.
  19. Chicago Vitreous Enamel Product Co., Cicero, Ill.
  20. Surface Combustion Co., New York, N. Y.
  21. Malleable Iron Range Co., Beaver Dam, Wis.
  22. The Michigan Stove Co., Detroit, Mich.
  23. The Estate Stove Co., Hamilton, O.
  24. Johnson Gas Appliance Co., Cedar Rapids, Ia.
  25. H. A. Wilson Co., Newark, N. J.
  26. National Stove Co., Div., Lorain, O.
  27. The Improved Appliance Co., Brooklyn, N. Y.
  28. Armstrong Cork & Insulation Co., Pittsburgh, Pa.
  29. Detroit Stove Works, Detroit, Mich.
  30. The G. S. Blodgett Co., Burlington, Vt.
  31. Walker & Pratt Mfg. Co., Boston, Mass.
  32. Strause Gas Iron Co., Philadelphia, Pa.
  33. New Process Stove Co., Div., Cleveland, O.
  34. Roberts & Mander Stove Co., Philadelphia, Pa.
  35. Reliable Stove Co., Div., Cleveland, O.
  36. Wm. M. Crane Co., New York, N. Y.
- Florentine Hall and Adjoining Rooms,  
Second Floor, Congress Hotel (dead exhibits).
37. The Bristol Company, Waterbury, Conn.
  38. Comstock Castle Stove Co., Quincy, Ill.
  39. The Baltimore Gas Appliance & Mfg. Co., Baltimore, Md.
  40. General Gas Appliance Co., New York, N. Y.
  41. Lindsay Light Co., Chicago, Ill.
  42. Detroit Washing Machine Corp., Detroit, Mich.
  43. The Wales Company, Kalamazoo, Mich.
  44. Reznor Mfg. Co., Mercer, Pa.
  45. Rathbone, Sard Co., Albany, N. Y.
  46. The Ofeldt Gas Fired Boiler Co., Nyack, N. Y.
  47. The Cleveland Heater Co., Cleveland, O.
  48. The Lovelink Water Heater Co., Philadelphia, Pa.
  49. Chambers Manufacturing Co., Shelbyville, Ind.
  50. Robertshaw Manufacturing Co., Youngwood, Pa.
  51. Peninsular Stove Co., Detroit, Mich.
  52. A-B Stove Co., Battle Creek, Mich.
  54. Connelly Iron Sponge & Gov. Co., Chicago, Ill.
  56. The Western Gas Construction Co., Fort Wayne, Ind.
  57. The Western Gas Construction Co., Fort Wayne, Ind.
  58. H. Mueller Manufacturing Co., Decatur, Ill.
  59. Acme Brass Works, Detroit, Mich.
  60. Pittsburgh Meter Co., Pittsburgh, Pa.
  61. The West Gas Improvement Co. of America, New York, N. Y.
  62. Quigley Furnace Specialties Co., New York, N. Y.
  63. Bartlett Hayward Co., Baltimore, Md.
  64. The U. G. I. Contracting Co., Philadelphia, Pa.
  65. The Koppers Co., Pittsburg, Pa.



## A. G. A. MONTHLY

66. The Schaeffer & Budenberg Mfg. Co., Brooklyn, N. Y.
67. Bailey Meter Co., Cleveland, O.
68. The Foxboro Co. Inc., Foxboro, Mass.
69. Taylor Instrument Companies, Rochester, N. Y.
70. John J. Griffin & Co., Philadelphia, Pa.
71. American Meter Co., New York, N. Y.
72. D. McDonald & Co., Albany, N. Y.
73. Johns-Manville, Inc., New York, N. Y.
74. Johns-Manville, Inc., New York, N. Y.
75. The Roberts Brass Mfg. Co., Detroit, Mich.
76. S. R. Dresser Mfg. Co., Bradford, Pa.
77. The Lattimer Stevens Co., Columbus, O.
78. Equitable Meter Co., Pittsburgh, Pa.
79. National Tube Co., Pittsburgh, Pa.
80. The Sprague Meter Co., Bridgeport, Conn.
81. The Gas Age-Record, New York, N. Y., and Chicago, Ill.
82. The Gas Industry, Buffalo, N. Y.
83. American Gas Journal, New York, N. Y.
84. The Intercolonial Gas Jour. of Canada, Hamilton, Canada.
85. The Eclipse Stove Co., Mansfield, O.
86. The Sands Manufacturing Co., Cleveland, O.
87. Hugo Manufacturing Co., West Duluth, Minn.
88. The Canton Clothes Dryer Co., Canton, Ohio.
89. Superior Meter Co., Brooklyn, N. Y.
90. Atlantic Tubing Co., Providence, R. I.
91. Republic Flow Meters Co., Chicago, Ill.
93. George M. Clark & Co. Div., Chicago, Ill.
94. Eriez Stove & Mfg. Co., Erie, Pa.
95. Humphrey Co. Div., Kalamazoo, Mich.
96. Hale Manufacturing Co., Chicago, Ill.
97. Benson Manufacturing Co., Chicago, Ill.
98. The Bryant Heater & Mfg. Co., Cleveland, O.
99. George D. Roper Corp., Rockford, Ill.
100. Pittsburgh Water Heater Co., Pittsburgh, Pa.
101. Van Zandt Gas Appliance Co., St. Louis, Mo.
102. Iron Oxide Products, Inc., Cicero, Ill.
103. The Hoffman Heater Co., Lorain, O.
104. American Range & Foundry Co., Minneapolis, Minn.
105. Ruud Manufacturing Co., Pittsburgh, Pa.
106. Kalamazoo Loose Leaf Binder Co., Kalamazoo, Mich.
107. The P. H. & F. M. Roots Co., Connersville, Ind.
109. Cribben & Sexton Company, Chicago, Ill.
111. Metcalfe-Shaw Corporation, New York, N. Y.



## Reduced Fares to the A. G. A. Convention in Chicago

Arrangements have been made with several of the Trunk Line Passenger Associations for fare and a half for the round trip to the American Gas Association Convention in Chicago, November 7-12, provided 350 certificates are presented at Chicago by members of the Association and their families.

In order to secure the advantage of this reduction in railway fare there are certain requirements which must be observed by all, therefore please note that,—

1. Reductions are only allowable from points in the territory covered by the Passenger Associations which have granted the reductions, as follows:
2. Tickets at the regular one-way tariff fares for the going journey may be obtained on any of the following dates (but not on any other date)

NOVEMBER 3 TO 9

In purchasing your ticket be sure to request a CERTIFICATE.

*Do not make the mistake of asking for a receipt.*

3. *Certificates are not kept at all stations.* If not obtainable at your home station the agent will inform you at what stations they may be obtained. You can in such case purchase a local ticket to the station which has certificates in stock, where you can purchase a through ticket and at the same time secure a certificate to Chicago.
4. Immediately on your arrival at Chicago present your certificate to

LOUIS STOTZ, ASSISTANT SECRETARY-MANAGER who will turn it over to the Special Agent of the Carriers for proper visé. The reduced fare for the return journey will not apply unless you are properly identified as provided for by the Certificate.

5. All certificates must be viséd by the special agent of the railroads who will be at the Association Registration Headquarters, Congress Hotel, Chicago, on November 10 and 11 from 8:30 a.m. to 5:30 p.m. for that purpose.

If you arrive at the meeting and leave for home again prior to the special agent's arrival, or if you arrive at the meeting later than November 11, after the special agent has left, you cannot have your certificate validated and consequently you will not obtain the benefit of the reduction on the home journey.

6. So as to prevent disappointment, it must be understood that the reduction on the return journey is not guaranteed, but is *contingent on an attendance of not less than 350 members of the organization at the meeting and dependent members of their families*, holding regularly issued certificates obtained from ticket agents at starting points, showing payment of regular one-way adult tariff fares of not less than 67 cents on going journey.
7. If the necessary minimum of 350 certificates is presented to the Special Agent, and your certificate is duly validated, you will be entitled up to and including November 16 to a return ticket via the same route over which you made the going journey *at one-half of the regular one-way adult tariff fare* from the place of meeting to the point at which your certificate was issued.
8. Return ticket issued at the reduced fare *will not* be good on any limited train on which such reduced fare transportation is not honored.

Summing up, buy one-way tickets to Chicago; get a Convention Certificate with each ticket; present Certificates for validation as soon as you arrive in Chicago; Certificates will be good for one-half return fare over the same route, provided three hundred and fifty are validated on November 10 and 11.

AMERICAN GAS ASSOCIATION  
OSCAR H. FOGG.  
*Secretary-Manager.*

## GENERAL

### CHAIRMEN OF GENERAL COMMITTEES ORGANIZED TO DATE

**Accident Prevention**—CHARLES B. SCOTT, Chicago, Ill.  
**Amendments to Constitution**—WM. J. CLARK, Mt. Vernon, N. Y.

**American Engineering Standards Committee, Representative on**—A. H. HALL, New York, N. Y.

**Award of Beal Medal**—CHARLES A. MUNROE, Chicago, Ill.

**Caloric Standards**—J. B. KLUMPF, Philadelphia, Pa.

**Chamber of Commerce, Representatives in**—GEORGE B. CORTELYOU, New York, N. Y.

**Convention Program**—J. B. KLUMPF, Philadelphia, Pa.

**Cooperation with Educational Institutions**—J. A. NORCROSS, New Haven, Conn.

**Devising Unit for Gas Measurement**—R. B. BROWN, Milwaukee, Wis.

**Educational**—WALTON CLARK, Philadelphia, Pa.

**Finance**—E. H. ROSENQUEST, Bronx, N. Y.

**Gas Safety Code**—W. R. ADDICKS, New York, N. Y.

**National Fire Protection Assn., Membership in**—W. R. ADDICKS, New York, N. Y.

**Nominating**—CHARLES L. HOLMAN, St. Louis, Mo.

**Rate Fundamentals**—R. A. CARTER, New York, N. Y.

**Standard Gas Appliances Specifications**—W. T. RASCH, New York, N. Y.

**United States National Committee of the International Commission on Illumination, Representatives on**—HOWARD LYON, New York, N. Y.

## Increasing the Summer Load

N. T. SELLMAN, Service Engineer, A. G. A.



Number 2—School

**W**ATER heating has for many years been a very attractive business for gas companies but full advantage to obtain it has not been undertaken because it was not until recently that the full possibilities of this business have been understood. A large portion of this field, as yet undeveloped, is particularly attractive as it will be a summer load only. This is true of large loft and office buildings, apartment houses, institutions and hotels with low pressure plants in operation, where during the winter

months the coal boilers supply both heating and hot water, and during the summer months a gas-fired automatic boiler supplies the hot water.

A great many buildings of the above mentioned classes often have their own high pressure power plants, which if converted to low pressure can be made into ideal gas consumers. Water heating will be summer consumption only, while most other steam requirements where gas boilers are suitable will yield an all-year load. I therefore present the

## A. G. A. MONTHLY

Original Layout	Disposal
High pressure boilers steam supplies	City electric service City gas Coal in winter for heating
A. Prime movers driving electrical generators for <ol style="list-style-type: none"> <li>1. Lights</li> <li>2. Elevators</li> <li>3. Motors</li> </ol>	Electricity supplied by central station Eliminates prime movers and generators
B. Pumps for <ol style="list-style-type: none"> <li>1. Boiler feed</li> <li>2. House water supply</li> <li>3. Fire sprinklers</li> <li>4. Sump and sewerage</li> <li>5. Hydraulic elevators</li> </ol>	Direct returns if possible Automatic motor driven Automatic motor driven Automatic motor driven Change to electric
C. Refrigeration	Motor driven
D. Direct heat for <ol style="list-style-type: none"> <li>1. Laundry                             <ol style="list-style-type: none"> <li>(a) Mangles</li> <li>(b) Pressers</li> <li>(c) Washers</li> <li>(d) Soap dissolver</li> <li>(e) Driers</li> </ol> </li> <li>2. Kitchen                             <ol style="list-style-type: none"> <li>(a) Steamers</li> <li>(b) Urns</li> <li>(c) Pots and kettles</li> <li>(d) Serving tables</li> <li>(e) Warming closets</li> <li>(f) Dishwashers, steam type</li> </ol> </li> <li>3. Water sterilizing</li> <li>4. Industrial purposes</li> </ol>	Gas fired steam boilers  Direct returns if possible, pressure 85 lbs. Low pressure—about 5 lbs. Low pressure—about 5 lbs. Low pressure or gas direct  Gas boiler, 40 lbs. pressure Gas boiler, or direct gas Gas boiler, or direct gas Gas boiler, or direct gas Gas boiler, or direct gas Gas boiler, low pressure Gas boiler, low pressure Gas boilers, pressure depending on work Direct gas possible in some cases.
E. Low pressure through reducing valves and exhaust steam <ol style="list-style-type: none"> <li>1. House heating</li> <li>2. Hot water supply</li> </ol>	Coal fired, pressure depending on size of building and heating system. Pressure under 10 pounds always possible. Direct returns to boilers wherever possible.  Water heaters supplied with steam from the house heating boilers during the winter months when building heat is necessary. During the summer months an automatic gas fired boiler of the house heating type supplies the steam.

## A. G. A. MONTHLY

following brief outline of how a very attractive demand for gas can be made along strictly good engineering and economic principles.

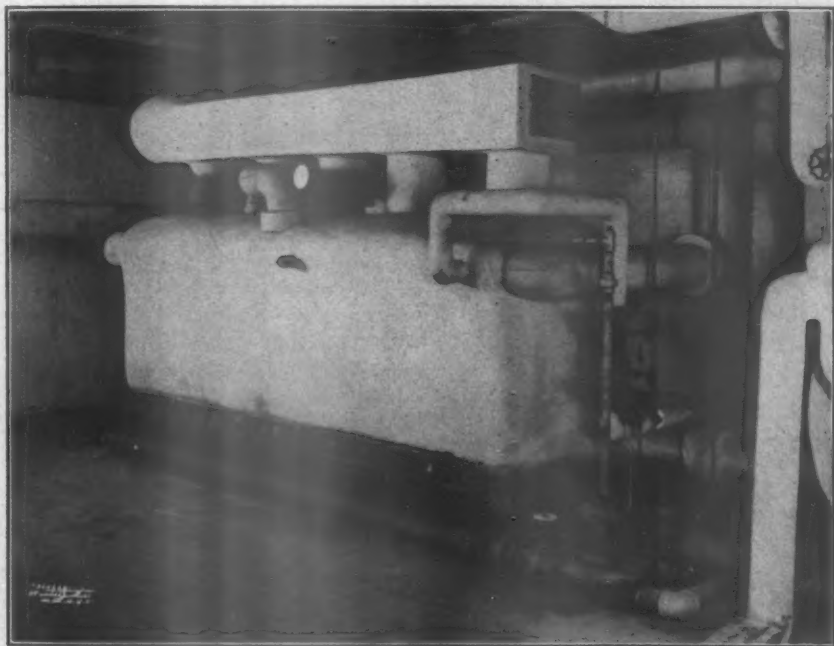
In practically all cities there are numerous buildings with high pressure boilers supplying steam to prime movers, hydraulic elevators, pumps, industrial heat, etc. Most of these high pressure plants, represent a large financial outlay, are uneconomical in fuel consumption, with high labor charges. It has been proven by many successful installations that big savings can be realized when such plants are properly converted to low pressure steam.

In converting a boiler plant of a large building from high to low pressure steam many problems arise that are of equal

interest to the electrical service man and to the gas man. The following table shows in a rough way, what equipment is encountered in buildings having high pressure boilers and the final disposal of this equipment when low pressure is substituted.

All the equipment given in the above table will rarely be encountered in one building, but a large hotel with its laundry will include all the items with the exception of industrial steam usages. The writer has encountered one large city office building where the following uses for steam had to be provided for by gas boilers:

1 Restaurant	1st floor
1 Club with restaurant service	top floor
1 Drug store	1st floor



Number 3. Boiler Used in School



## A. G. A. MONTHLY



Number 1. Office Building

- |               |           |
|---------------|-----------|
| 1 Cafeteria   | 1st floor |
| 1 Candy store | 1st floor |

Hot water for entire building

Sterilized drinking water, entire building

The total horse power requirement in this building was 103 horse power, divided among eight boilers, four of which had to be operated at 45 pounds pressure because of the kitchen layouts. There are, however, many uses for steam in the kitchen where low pressure would suffice if sufficient heating surface is provided and if the pipe sizes are ample.

As a rule it is advisable to provide separate gas boilers, as close as allowable, for each distinctive demand; first, because it keeps the boiler sizes down to commercially available sizes; second, a boiler always operates most efficiently at or near its rated horse power; third, piping can be greatly simplified and radiation losses from this source reduced;

fourth, it makes each user independent and minimizes the possibilities of failure in service.

Industrial gas-fired steam boilers for both high and low pressure work can be used wherever pressure control alone will suffice. If, however, accurate thermostatic control is desired as in the case of hot water supply, then it is advisable to use the regular gas fired house heating boilers as they are better adapted for this work. In the case of the high pressure boilers it may sometimes be necessary to provide an automatic feed system to force the water in the boilers. For this purpose there is a "Trap feed system" available, which is most suitable for small boilers as it requires no outside power and has no losses other than those due to radiation of the exposed surfaces. If the equipment is properly selected and installed, then all boilers can be made automatic and be economical in their operation.

Below are results obtained in a large loft building used for industrial purposes. It is a 14-story building with 2,750,000 cu. ft. contents.

I give the units for gas and electricity so that each gas man can apply the rates prevailing in his city and then compute what the saving would be in his own particular case. The rates in the city where this installation is located were such that the saving was \$21,000 in the first year. The "change over" more than paid for itself in the first year as the cost of all the equipment with labor and supervision was \$13,000. The gas equipment required was as follows:

- 1 Automatic low pressure heating boiler with a rating of 820 gals. per hour.

## A. G. A. MONTHLY

	Year 1919-1920 Private operated plant
Coal	5200 tons \$58,000
Labor	20,000
Oil	1,400
Ash removal	1,600
Repairs	3,000
	\$84,000

Purchased electricity  
Gas for hot water 6 summer months  
Gas, industrial, year  
Total, gas

	Year 1920-1921 Purchased electricity and gas
	670 tons \$8300*
	3850
	40
	170
	75
	\$12,435

K. W. hrs. 1,385,000  
Cu. ft. 1,900,000  
Cu. ft. 1,800,000  
Cu. ft. 3,700,000

1 10-H. P. high pressure boiler with trap feed.

1 Set of industrial burners for a dry room with an hourly rating of 120 cu. ft. per hour.

The 14-story building for which the above figures are given is shown in illustration No. 1. Hot water is supplied through 284 fixtures to approximately 1800 people. About 12,000 gals. of hot water are used per day and are made at a rate of about 1½ cu. ft. of gas per gal. when delivered at 140° F.

The building shown in illustration No. 2 is a school where the boiler, illustration No. 3, supplies all the heat for the water heating tanks during the summer months.

The hotel shown in illustration No. 4 has 170 rooms, of which 154 are with bath; a large restaurant is also supplied with hot water. There is an average of 18,000 gallons used per day; the water being heated to 135° F. at an average rate of 1½ cu. ft. of gas per gallon. The heater capacity is 820 gallons per hour, and the storage is 950 gallons.

These few illustrations are shown as examples of the work accomplished ties that it presents.

\*Coal for house heating and hot water in winter.



Number 4. Hotel.

along these lines. It is a line of endeavor that can keep all commercial gas men busy for a long time to come, and I feel that this article will have served its purpose if it only starts the gas men, who are entrusted with this sort of work, thinking seriously of the great possibili-

## Quality First

It is disappointing to find that there are gas companies who refuse to encourage the appliance manufacturers whose ranges are constructed in strict accordance with the Standard Gas Appliance Specifications of the American Gas Association. In the search for the cheapest appliances, some companies have actually encouraged, or at least tolerated, departure from these specifications and that means that their gas appliance business is ultimately going to suffer no matter how alluring the momentary prospect of "cheap buying" may be. The appliances which consume gas should be of the best possible construction consistent with reasonable price. That is what the standard specifications were intended to provide and they do it. Progress in the field of appliance development is not being helped by the exploitation of cheaply constructed goods. Real merchandisers know better.

## ACCOUNTING SECTION

W. H. PETTES, Chairman

H. W. HARTMAN, Secretary

EWALD HAASE, Vice-Chairman

### MANAGING COMMITTEE — 1921

#### At Large

BRUNDAGE, H. M., New York, N. Y.  
 CONOVER, J. L., Newark, N. J.  
 DOERING, W. A., Boston, Mass.  
 FERRIS, E. J., (Mfr.) New York, N. Y.  
 HEINS, J. W., Philadelphia, Pa.  
 JAMES, F. M., Aurora, Ill.  
 JOHNSTON, ERNEST, Syracuse, N. Y.  
 McLEOD, J. E., St. Louis, Mo.  
 MYERS, W. J., New York, N. Y.  
 SAUER, W. A., Chicago, Ill.  
 SCOBELL, E. C., Rochester, N. Y.  
 STERRETT, W. G., Chester, Pa.

#### Representing Affiliated Societies

ARMSTRONG, J. J., Toronto, Can. (Canadian)  
 BORDEN, A. W., Hastings, Nebr. (Iowa)  
 CHAPIN, C. H. B., New York, N. Y. (Empire State  
 G. & E. Assn.)  
 DEAL, E. C., Springfield, Mo. (Missouri)  
 EATON, H. M., Detroit, Mich. (Michigan)  
 HAASE, EWALD, Milwaukee, Wis. (Wisconsin)  
 HOUGHTON, W. E., Los Angeles, Cal. (Pacific Coast)  
 HOT, CHAS. W., Glassboro, N. J. (New Jersey)  
 JAMES, F. M., Aurora, Ill. (Illinois)  
 McCABE, J. B., Dallas, Texas. (South Central)  
 NORTON, W. F., Nashua, N. H. (N. E. Gas Eng.)  
 PORTER, EDW., Philadelphia, Pa. (Pennsylvania)  
 SHEARON, B. P., Hammond, Ind. (Indiana)  
 STOTHART, E. C., Charleston, S. C. (Southern Gas)

### CHAIRMEN OF SECTION COMMITTEES ORGANIZED TO DATE

Fire Insurance Rates—E. C. SCOBELL, Rochester, N. Y.  
 Job Order Systems—F. M. JAMES, Aurora, Ill.  
 Office Labor Saving Devices—J. L. CONOVER, Newark,  
 N. J.  
 Continuous Inventory of Fixed Capital—ERNEST JOHN-  
 STON, Syracuse, N. Y.  
 Nominating—W. A. DOERING, Boston, Mass.

Standard Classification of Accounts and Form o  
 Annual Report to Public Service Commissions—  
 W. J. MEYERS, New York, N. Y.  
 State Representatives—EWALD HAASE, Milwaukee, Wis.  
 Uniform Accounting Nomenclature—W. A. SAUER,  
 Chicago, Ill.

## Consumer's Bills

W. A. DOERING

Auditor, Boston Consolidated Gas Company

ONE of the real problems ever present with a gas company is that of consumers bills. Every company is constantly trying to improve its billing, to have their bills accurate, out the quickest possible time after the reading and to have them legible.

The bill is a direct contact between the consumer and the company. It establishes the relation that exists,—either one of confidence or of distrust.

The many necessary technical terms used and the readings that are shown, are misunderstood by the average consumer. A poorly made figure, or an indefinite item is sufficient to cause a complaint. This means annoyance, explana-

tions, delayed collections and greater operating expense.

Last year the Boston Consolidated Gas Company desired to improve its method of billing and after extensive research, solved the problem by installing several Burroughs Billing Machines, to be used in conjunction with the Addressograph metal plate. The operator takes the readings directly from the meter cards, setting up on the keyboard the old and new dates and readings,—the machine automatically giving the difference or the consumption. By glancing at a chart, the amount is established and set up on the keyboard of the machine. The operating bar is touched, printing the

## A. G. A. MONTHLY

the item on the bill and automatically repeating on two stubs, clearing and returning to position for the next bill. In the event of an unpaid balance, the total can be retained in the machine, the unpaid item set up and printed as above and this item is automatically added to the amount in the machine giving the total due. This amount is printed on the bill and repeated on the stubs. Other items such as appliance charges, discounts, etc., can be automatically added or subtracted as desired.

The new operators that we trained to operate the machines were quick to be-

come familiar with the detail and in a short time were producing a much greater quantity than could be done by hand. One operator reached a total of 1898 bills in a day of 7½ hours without calling back bills. The average per machine with calling back is 900 per day as against 600 per day under the old method of making bills by hand.

It is not in the production alone that we gain, but in the neat appearance of the bills, accuracy, fewer complaints, easier adjustments and a much more satisfactory condition than we experienced with the old method.

**W**HEN public utilities realize what high-grade service means and what effect such a service in its operation has upon its customers and the public, then the question of municipal or governmental ownership will gradually drop into the background, and the public recognition of the difficulties and of the need for encouragement and liberality will quickly aid in the solution of the national problem.

EDWARD N. HURLEY.



## ADVERTISING SECTION

M. C. ROBBINS, Chairman

A. A. HIGGINS, Vice-Chairman

CHARLES W. PERSON, Secretary

### MANAGING COMMITTEE — 1921

#### At Large

CLARK, WM. J., Mt. Vernon, N. Y.  
ELSMAN, RALPH, Brooklyn, N. Y.  
HANLAN, JAMES P., Newark, N. J.  
MULLANEY, B. J., Chicago, Ill.  
MACSWENEY, JOSEPH P., Rochester, N. Y.  
PATTENGILL, ANDREW F., JR., Cambridge, Mass.  
WAGNER, F. H., Baltimore, Md.  
WARNER, GEO. H., New York, N. Y.  
WELSH, WILLIAM J., Stapleton, N. Y.

#### Representing Affiliated Societies

ALLEN, GEO. W., Toronto, Can. (Canadian)  
BURNS, J. J., St. Louis, Mo. (Missouri)  
CARRAWAY, LEAKE, Norfolk, Va. (Southern)  
CHAPIN, C. H. B., New York, N. Y. (Empire State Gas & Electric Association)  
FRANKLIN, S. J., Millville, N. J. (New Jersey)  
FUGATE, FRANK, Detroit, Mich. (Michigan)  
GOULD, WM., Boston, Mass. (N. E. Gas Eng.)  
HARTOG, JOHN H., Portland, Ore. (Pacific Coast)  
JASPERSON, R. O., Chicago, Ill. (Wisconsin)  
LESTER, F. M., Chicago, Ill. (Illinois)  
ENGLISH, A. L., Council Bluffs, Ia. (Iowa District)  
MULHOLLAND, S. E., Fort Wayne, Ind. (Indiana)  
ROLSTON, R. J., Philadelphia, Pa. (Pennsylvania)

## Advertising "Up in the Country"

W. G. MURFIT

*Bucks County Public Service Company.*

**W**HEN, in December 1918, we inaugurated the policy of advertising consistently, the first question was: What should be the nature of such advertising?

We concluded that our most important product was Service, appliances being secondary. The three reasons forming a basis for this decision were; first, that consumers could not obtain Service until the appliances were procured, and if we sold the Service the appliances would naturally follow. In the second place, consumers who already had appliances would certainly be persuaded to use them to a fuller extent if we could carry the message of Service to them. The third was that we desired to tie the interests of the company more closely to the interests of the people in our territory. In other words, we

wanted our customers to think of the Bucks County Public Service Company as their company; a company dealing frankly with them in all matters.

As a result, few of our advertisements mentioned appliances of specific make, the Service they performed being dwelled upon instead. We have, likewise, tried to word our advertisements so that instead of talking to our customers, or prospective customers, we talked with them. This difference is most important.

The company covers almost the entire lower half of Bucks County, Pennsylvania, serving fourteen towns in addition to numerous hamlets. There are two daily papers published in the County seat which is supplied with gas by us, and the papers circulate freely throughout our territory.

*Mr. Murfit's article presented here is a worthy companion to Mr. Wyckoff's convention paper entitled: "What Advertising Did for One small Town Gas Man." Here are two alert, aggressive members of our industry who are making history for the cause of continuous advertising. Like Harford Powel of Collier's, they will tell you there is no such thing as an advertising campaign. Either you advertise or you don't advertise.*

### IS THIS FUNNY OR SAD?

A man opened his "gas" bill. It was far—well never mind how much. He smiled. "That's not as bad as I expected. We survived about quite a bit last month." Went to Boston twice and drove the Jones' to Willow Grove.

This man then opened another gas bill. It was far—well half as much as the other bill. And it covered the expense of fuel for range and water-heater and lights for a family of four for the month. And did he smile? He did not. On the other hand he rained Cain and threatened to hang certain persons to a lamp-post.

Funny world, isn't it? Or is it a sad one? That depends on the viewpoint.

**Bucks County Public Service Co.**

"They Say That Gas Can Do It Better."

### AN INVITATION

You are invited to visit our new office in Doylestown. It is at No. 58 South Main Street, just above the fountain.

We have made these new quarters as attractive as possible and are exhibiting the newest gas appliances.

But don't call believing that you are always expected to buy. Drop in—and this applies to all of our offices—just to look around, or to inquire as to the operation of appliances you already own. We particularly urge you to do this latter as we want to give Service first of all.

If we take care of the Service the Gas will take care of itself.

**Bucks County Public Service Co.**

"They Say That Gas Can Do It Better."

### The Consumer's Interest Comes First

The Gas Range which gives the consumer the best service with the least gas consumption is the best range for us to sell.

For this reason, we sell only those Ranges which conform strictly to "A. G. A." specifications, insuring long life and satisfactory, economical operation.

**Bucks County Public Service Co.**

"They say that Gas Can Do It Better."

There are also two weekly papers, with somewhat smaller circulation than the dailies and these are published in other and separate towns in our district.

The advertisement "copy," after being whipped into shape, is typewritten, four carbon copies being made. One copy is sent to each paper and noted therein is the date or dates on which it is to be inserted, and the amount of space to be occupied. Two columns wide and three inches deep is the space used in each

### GAS AS INSURANCE

Recently a high police official who is known all over the world for his capabilities made the statement that a single gas light left at night in a store was the best burglar insurance in the world. This was a new way of regarding gas. It seemed, for nobody, we believe, has given a great deal of thought to the fact that gas can be used to keep burglars away. Is your store left dark at night?

The fact that gas can be used to insure the safety of property can apply to residences also.

This is worth your consideration.

**Bucks County Public Service Co.**

"They say that Gas Can Do It Better."

### WHY BE SO TIRED AT BED-TIME?

Gas-Service is fundamentally a labor-saving service. Therefore, to a degree and barring waste, the amount of your gas bill indicates the efficiency of your household management.

Now-a-days it is most important to conserve human energy—to save yourself. For instance, on Sundays you want the maximum time for church, for your family and for yourself. Gas-Service helps wonderfully in accomplishing this; yet you do not slight your dinner. Rather is it prepared more easily, more promptly, more comfortably; and of course, piping hot.

If gas always did more of your work for you, you wouldn't be so tired at the end of the day.

**Bucks County Public Service Co.**

"They Say That Gas Can Do It Better."

### "IN THE SPRING A YOUNG MAN'S FANCY."

Sometimes turns to thoughts of building a home. And when he considers the equipment that is needed in it, he decides that only a gas-kitchen will do. Nothing can be so good for the occupants of that home.

Likewise other men, intent on improving the old place, acknowledge that gas can do many things better, by installing a gas range to lighten the summer's burdens.

Both of these men want service; and gas service is ideal service.

**Bucks County Public Service Co.**

"They Say That Gas Can Do It Better."

newspaper. The advertisement is inserted on Mondays, Wednesdays and Saturdays in the daily which has the largest circulation; the other daily paper prints the same copy on Tuesdays and Thursdays, Friday being reserved for the weekly papers, both of which appear on the same day. Thus the advertisement runs unchanged for one week, distributed among all available papers. We neither design the "make-up" nor have proofs submitted. The papers have performed

this work, without any trouble on our part and it has been done very satisfactorily. Our method thus requires a minimum amount of time and labor and yet insures the maximum chance that our advertising matter will be read.

Occasionally, when we have a particularly long message to deliver, more space is used. The writer is now connected with three other companies, two in North Carolina and one in South Carolina, and the same plan is being put into effect so that they may be included in the work as

syndicated in Bucks County. In the case of these Southern companies, however, allowances must be made for the time of insertion to meet climatic differences. A heating stove advertisement in Bucks County, for example, would appear in the South several weeks after it had been used at home.

We find that this work takes but little time and is one of the most pleasant tasks of our job. Ideas are gathered from expressions of customers, from a phrase or two extracted from an advertisement, and

## "Gas Odor Gone"

You don't find any objectionable odor in the Gas now, do you? But you did about two months ago; and you told us about it. That was proper.

The condition then was simply unavoidable, being due to an unexpected change in the character of the oil we received. However, about six weeks ago we succeeded in overcoming the trouble and now you can burn gas without the slightest trace of odor.

This announcement is probably unnecessary, as doubtless you are already aware of the improved condition. But we want to take this opportunity to inform you that your Gas Service is our greatest concern, and we are continually making efforts to better it.

## Southern Gas Improvm't Co.

"They Say That Gas Can Do It Better."

Members of the American Gas Association.

## NOTICE TO GAS CONSUMERS

We want to ask that if possible you do your cooking before eleven o'clock on Sunday, March 20, as we will have to begin some work at the plant about twelve o'clock, and by you doing your cooking before this time we will probably be able to keep gas on the town.

In case we find it necessary to cut off the gas it will have to be done about one o'clock, and will be turned on again Monday morning at six o'clock, if possible.

If the gas is cut off, be sure on Monday morning when it is turned on again to light all pilots on Ranges, Water Heaters and Lights.

Thanking you for your past favors.

## ROCK HILL GAS COMPANY

"They say That Gas Can Do It Better."

## ON THE JOB

Here again, dusty with travel, tired, hungry. "Something to eat-quick," and you turn to the kitchen range. A patch, a twist of the wrist, and there it is the same old reliable and efficient gas!

Yes, and it has been there waiting for you all the time, ready to respond instantly to any demand you make upon it.

Tomorrow you will call upon us again for service, but you will give us no warning from hour to hour just what your requirement will be. Yet the gas will be there, plenty of it at all times, ready to be used in large or small quantities as you see fit; and to be paid for after you have used it.

Again our willingness and constant readiness to serve you! Yes, as it means having gas on tap 24 hours a day, 365 1/4 days a year, whether you use it or not.

Have you ever thought of it in this way?

## Bucks County Public Service Co.

"They Say That Gas Can Do It Better."

## JULES VERNE'S HERO AND THE GAS BILL

Do you remember Phineas Fogg, Jules Verne's hero? Well, Phineas departed on his eighty-day trip around the world but forgot to turn out the gas jet that was burning in the bathroom. Fortunately, he remembered that he had left the gas burning and there was no argument over the bill.

Forgetfulness of this sort, however, is a frequent occurrence and it seems to be human nature for the customer to first blame the company, claiming that the meter is wrong, and then discover his mistake.

When your gas bill appears to be too large, think twice before you blame the meter, for it isn't very often the meter's fault.

## Bucks County Public Service Co.

"They Say That Gas Can Do It Better."

## "THE WEEK THAT MAKES THE SUMMER SAFE."

April 11th to April 16th.

This new name for "Clean-Up Week" originated with the Department of Health; but Gas service will play an important part in making the week a success.

Plenty of hot water:—Use a gas water heater. Freedom from ashes and dirt:—Use a Gas Range. Avoid lighting substances:—Use Weisbach Gas Lamps.

Gas in the home means not only a safe summer but also a pleasant summer wherein household cares are reduced to a minimum. Why not have a "gas" summer this year?

## Bucks County Public Service Co.

"They Say That Gas Can Do It Better."

## A. G. A. MONTHLY

from suggestions by other employees of the company. The Chat advertisements of the A. G. A. have been adopted by changing the "make-up" to suit our standard arrangement, and by re-wording the title to conform the gist of the matter. Often we have connected a holiday or local event with Gas Service. An instance of this is "Every woman celebrates Every day as Labor Day when she has Gas Service do much of her work for her. In view of this, are you celebrating daily or only annually?"

We believe that we have, in a comparatively satisfactory measure, reached the ends we sought. In 1917, we instituted a readiness-to-serve charge which was so distasteful to our customers that we were compelled to abandon it in two months. After a year's advertising, or in July, 1920, we again inaugurated a service charge and raised our rates, and although there were individual protests, no organized action was taken against it. It would be unfair to claim that this was the result of newspaper advertising alone, for our manager and I consistently attended every public gathering, Chamber of Commerce, or Improvement Society meeting and explained the merits of our case. On the other hand we believe that advertising had much to do with it.

Writing the advertising copy consumes but little time. Some advertisements are mulled over in our minds before taking shape on paper. Others are run off in a minute or two when an adaptable idea is gleaned from an outside source. That our public announcements are read, and the attitude of the company favorably viewed, is evidenced by one we ran last

spring. Alternate freezes and thaws had caused leaks to develop in our high pressure lines, and we advertised asking that, "If, in passing on the highways of the district covered by our mains, you detect an odor of gas, will you promptly report the matter to one of our offices." We pointed out that loss of gas was a mutual loss, as our rates were predicated on our costs. Several leaks were at once reported from remote points, promptly repaired and the persons reporting them were duly thanked.

There is another important argument in favor of continuous advertising that should not be overlooked. The ears of the editors are more easily reached by advertisers who consistently use the columns of their publications than those who advertise by fits and starts. Here is a most important fact to bear in mind. I do not mean that any attempt to impose upon the editor would be countenanced, but a request may properly be submitted for the inclusion in the news columns of his paper matters that have more of a news than of an advertising flavor, all relating to the affairs of the company, of course. The manager and I frequently drop in the sanctum sanctorum of each paper for a chat with the editor. We tell him our troubles and our hopes; and we have yet to complain of unfair treatment. Sometimes when we are in possession of exclusive news information outside the realm of the gas business, we often "tip off" our editorial friends and they enjoy a mild "scoop." Likewise, we try to make more of our advertising than mere words on a printed page. As intimated before, we belong to all local civic organizations, attend the meetings and take

## A. G. A. MONTHLY

such part as we can. Furthermore, we teach employees that, "You are the Company;" and the Company has never lost prestige thereby.

Our customers appreciate the difficulties under which we operate and they are evidencing increased faith in our honest endeavor to treat them fairly. They

could hardly be expected to do otherwise, for we are living and intend to live up to all our promises and statements made in our advertisements.

Under no circumstances would we abandon our policy of continuous advertising in newspapers. We believe it is returning profits beyond measure!

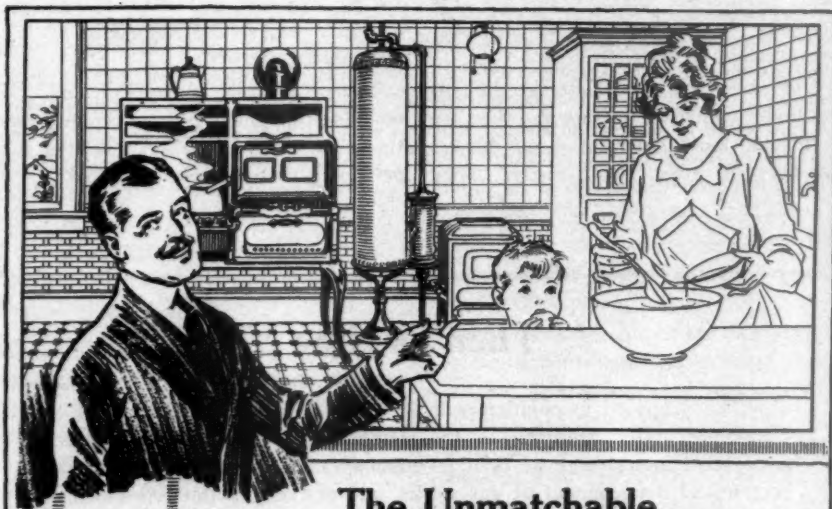
### Then as Now

The proposed association will, if established, be beneficial alike to companies and consumers—to the companies, because it will produce a constant interchange of opinion upon all matters connected with the economical management of gas-works, and to the consumers, because it will be the means of cheapening the cost of production, and so enable the companies to lower the price to them. It will serve to remove those prejudices which are founded in ignorance, and which are as vexatious to the managers of gas companies as they are irritating to the gas consumers, for it will enable those who possess the proper information to enlighten the public, by spreading before them, from time to time, such explanations as cannot fail to convince the intelligent that a business which requires so much capital and such nice scientific management, must, to be prosperous, be honestly as well as ably conducted.

*American Gas Light Journal.*

1860





## The Unmatchable Convenience of Gas Service

It is—

*Bringing leisure and independence to the American housewife.*

*Conserving strength and health by eliminating drudgery.*

*Making happy, attractive, contented homes by furnishing cheerful, eye-comforting illumination, quick intense heat or steady, dependable warmth.*

*Doing away with disease-laden smoke, grime, soot, ashes and fumes.*

*Saving linens, draperies, rugs, upholstery, wall paper, furniture and clothes.*

*Helping us all to have a pleasanter place in which to live and enjoy the good health that goes with a pure, wholesome atmosphere.*

A service as intimate as this must need be friendly. Let us deal with it in a friendly way.

*(Insert the name of your Company here)*

MEMBER OF THE AMERICAN GAS ASSOCIATION



## Good Will Advertisement Number 19

## COMMERCIAL SECTION

H. S. SCHUTT, Chairman

LOUIS STOTZ, Secretary

A. P. POST, Vice-Chairman

### MANAGING COMMITTEE — 1921

#### At Large

ABBOTT, M. E., Taunton, Mass.  
BARNES, CYRUS, Boston, Mass.  
BARNITT, F. R., New York, N. Y.  
BARTHOLO, WM. H., New York, N. Y.  
BENNETT, GEO. E., New York, N. Y.  
DAVIS, J. E., Chicago, Ill.  
GASTON, LUTHER, Lebanon, Pa.  
GOULD, WM., Boston, Mass.  
HEWITT, ARTHUR, Toronto, Ont., Can.  
JELLIFFE, C. N., New York, N. Y.  
KAHN, A. M., Hamilton, Ohio  
LEARNED, J. G., Chicago, Ill.  
LEWIS, FRANK, Kalamazoo, Mich.  
LOEBELL, HENRY O., New York, N. Y.  
LONG, H. J., New Brunswick, N. J.  
MYERS, J. B., Philadelphia, Pa.  
POST, A. F., Philadelphia, Pa.  
RUTLEDGE, F. J., Philadelphia, Pa.  
SCHUTT, H. S., Philadelphia, Pa.  
SHERWOOD, J. M., New York, N. Y.  
SMITH, CHAS. S., Philadelphia, Pa.  
STEPHANY, E. J., Pittsburgh, Pa.  
YOUNG, R. R., Newark, N. J.

#### Representing Affiliated Societies

BURKE, E. J., Indianapolis, Ind. (Indiana)  
CHAMBERLAIN, G. R., Grand Rapids, Mich. (Mich.)  
CHAPIN, C. H. B., New York, N. Y. (Empire State)  
CLARK, H. H., Chicago, Ill. (Illinois)  
CORN, WILEY F., Mexico (Missouri)  
CRAFTS, H. C., Pittsfield, Mass. (N. E. Gas Eng.)  
CRANKSHAW, J. WARD, Allentown, Pa. (Pennsylvania)  
FLAUTE, J. J., New Orleans, La. (South Central)  
FOREY, J. A., Charlotte, N. C. (Southern)  
HANLAN, J. E., Newark, N. J. (New Jersey)  
JOHNSON, W. B., Toronto, Ont. (Canadian)  
ST. JOHN, JOHN, Madison, Wis. (Wisconsin)  
TAYLOR, W. H., Omaha, Neb. (Iowa District)  
WEISS, FRANK, Los Angeles, Cal. (Pacific Coast)

### CHAIRMEN OF SECTION COMMITTEES ORGANIZED TO DATE

Gas Lighting—F. R. BARNITT, New York, N. Y.  
Heating—GEO. E. BENNETT, New York, N. Y.  
Industrial Fuel Sales—HENRY O. LOEBELL, New York, N. Y.  
Industrial Fuel Contracts (Sub.)—CHAS. S. SMITH, Philadelphia, Pa.

Customer Service—J. B. MYERS, Philadelphia, Pa.  
Merchandising—H. J. LONG, New Brunswick, N. J.  
Nominating Committee—J. D. SHATTUCK, Chester, Pa.  
Program—F. J. RUTLEDGE, Philadelphia, Pa.  
Rate Structure—J. D. SHATTUCK, Chester, Pa.

## Pay As You Sell

WILLIAM GOULD, Commercial Manager, Gas and Electric Improvement Co., Boston, Mass.

**W**HAT the Gas Industry needs most at this time is something that will help it to

1. Start up selling.
2. Start up buying.
3. Start up production.
4. Create new sales agencies.
5. Increase selling results.
6. Increase buying.
7. Increase production.
8. Better present sales methods.
9. Increase output of gas.
10. Boost the entire industry.

If any or all of the foregoing steps in our reconstruction program could be

got underway, it would help us all to get over the present "Waiting for something to happen" period.

It is the writer's opinion that a change in policy and merchandising methods is essential if the gas industry is to again take its rightful place among the industries of the country. The "Pay-As-You-Buy" methods still in use are doing much to retard a resumption of intensive selling effort by gas companies, and it is the opinion of the writer that what we really need, under present conditions, is to adopt the plan of "Pay-As-You-Sell."

## A. G. A. MONTHLY

This leads us to consider whether the best interests of the manufacturer, the gas company and the ultimate consumer would not be served best by adopting a new plan, at least until business conditions become more normal, namely that the manufacturers allow gas companies to pay for appliances as they sell them, in place of compelling the gas company to purchase outright a quantity of appliances or place blanket contracts for their estimated season's requirements.

While it may be true that under normal conditions, when the industries of the country are going at full speed and the buying power of the public at its peak, there is not the necessity for this. We are now confronted with a different condition.

This suggested plan does not mean consignment of goods, as it has never increased sales, and has cost the manufacturer a lot of money. When an article was consigned to a company it was done as a favor to the manufacturer, and did not carry any arrangement with it for the proper showing, advertising or selling of the sample, and in a great majority of the cases the sample was returned. The "Pay-As-You-Sell" method carries with it all of these arrangements, and the gas company agrees to certain things, namely, a definite sales plan for the appliance, a definite advertising space to be given over to it, the show window space and show room to be devoted to it, and the whole organization back of the effort to put this appliance on its mains, which is a very different proposition than on the "Consignment of Goods" basis.

The gas industry has for the past four years been severely handicapped by con-

ditions with which we are familiar; inability to secure, until very recently, increases in rates, increases in labor costs and prices of essential materials for gas manufacture, construction work held up due to inability to secure new capital have all had their influence in retarding gas company operations, particularly that of the Sales Department. Any extensive sales effort during this period would have required new capital expenditures for new extensions, investment in mains, services and meters, and the result has been a general and pronounced slowing down of commercial activity.

What we need now is something which will stimulate the industry to GO AHEAD AGAIN.

At this particular time, in a dropping market, all over the country, the buying of appliances by gas companies, particularly the smaller ones, is on a hand-to-mouth basis, so much so that the selling results are the same, production has almost stopped, warehouses are pretty well filled, and we are all wondering how we can start things going.

The biggest factor that has brought this condition about is the unwillingness and inability of gas companies to invest any considerable sum in stocking up during a dropping market. Manufacturers have also materially reduced their selling organizations, consequently selling campaigns are practically unheard of so that sales are dwindling, and there is a general lack of interest in gas company merchandising.

Successful and profitable gas appliance selling campaigns could be revived if this big investment of money was eliminated, and it is at this point that a change in

policy by the manufacturers in allowing the gas company to "Pay-As-They-Sell" would stimulate sales effort.

Convenient payments, time payments, installment payments, are known to be great helps in retail selling of goods in all lines of business. Under this method goods move more quickly and in larger quantities than when a total cash payment is demanded. This the gas companies have found to be the case whenever they have used it with their customers.

Now it is logical to assume that this will also be true if applied to the manufacturers' customers, namely, the gas companies and the dealers.

Very few of the gas companies are now having real sales campaigns but the manufacturers must move their stocks of finished goods from their crowded warehouse, where their goods are eating their heads off. The ability of the manufacturer to move his product therefore depends upon the ability of the gas companies and dealers to place these goods with the ultimate consumer, and any plan which will stimulate this movement will undoubtedly appeal to the manufacturer.

It is suggested that the manufacturer agree to ship a sufficient quantity of goods for the gas company to make a creditable display, and that the gas companies in turn agree to carry on at least a two weeks' selling campaign of these goods, placing them in the most conspicuous place in their show room; devoting their entire show window space to this purpose; taking sufficient newspaper space to properly advertise, and further that the manufacturers' sales

representatives cover their field thoroughly acting in an advisory capacity to the gas company's sales manager, coaching the gas salesmen and all co-operating in an intensive effort to start the ball rolling. Under such an arrangement with the manufacturer agreeing also to allow the gas company to pay for these goods as they are sold by the gas company, it should be possible to move a much greater quantity of merchandise both from the manufacturer to the gas company and by the latter to its consumers.

It will do even more. It will make it easier for small companies to actively enter the selling field, where heretofore they have never had the desire, confidence or ability to swing the campaigns, it will teach many how to sell goods in a way that will encourage them to continue such effort.

This will result in many new selling agencies being created by reason of having many gas companies actively merchandising where latterly they have been most inactive in that direction.

A successful sales effort must be started with a fairly large show of goods, but if these have to be bought outright from the manufacturer, then there would be little incentive for the sales manager to start anything.

The natural outlet for the manufacturers' goods is the gas company and the dealers, and if more goods can be sold on convenient or easy payments to their customers, it is logical to suppose that the gas companies will buy more of the manufacturer if they (the gas company) can secure the goods on an equally interesting basis.

(Continued on page 641)

## Making Your Window Bring Business

**T**O get real variety in window displays as seasons change and ranges, irons, lights and heaters succeed each other behind the plate glass, is the problem that every gas window trimmer must face. For, although the appliances and the color of backgrounds are changed, there is often a monotony in the total effect which permits the interest of the passer-by to flag and the sales to fall off.

Real variety comes not from a difference in arrangement and color combinations but from an actual difference in the purpose of the display.

Too many windows are planned merely to present a number of articles to the public eye.

As the public becomes more familiar with the size, shape and general outline of gas appliances a mere "show" of articles however artistically arranged, becomes less suited to attract and hold attention.

(1) A window display may be planned for the purpose of showing some use to which an appliance can be put. A live model may actually carry on the work, or a dummy and window cards may suggest it. Thus, instead of the simple idea, "gas iron," the far more forcible one "gas irons lessen laundry work" is presented. A water heater display can be built on the idea of dish washing, an industrial appliance display, on the use of gas for forging. People ask first of all, "What does it do?" and "How does it do it?" Build windows to answer these questions.

(2) Use your window to illustrate your story. Pick out some one strong idea or selling point. Then illustrate it concretely. On page 3 of the August folder you will find a good example of such a display. It drives home the saving in labor effected by a gas iron.

(3) Use your window to advertise **Service**—house maintenance, inspection, piping plans for architects or home builders, etc. The January folder, page 4, shows a window of this type.

(4) Just for variety, on rare occasions, a window may be planned solely with an eye to making a pretty picture. A water heater standing as a lighthouse in the midst of a billowy sea of green muslin, with a painted background of clouds just breaking to show the moon would attract unlimited attention, and a clever sign maker could even give it some selling value, too.

Work, then, for variety, by changing the fundamental idea that animates the display.



## MANUFACTURERS SECTION

GEO. S. BARROWS, Chairman

JOHN S. DeHART, Jr., Vice-Chairman

PERCY H. HALL, Secretary

### MANAGING COMMITTEE — 1921

#### At Large

BARROWS, GEORGE S., Providence, R. I.  
BRUCE, HOWARD, Baltimore, Md.  
CONROY, J. F., New York, N. Y.  
CRANE, WM. M., New York, N. Y.  
DeHART, JR., J. S., Newark, N. J.  
GRIBBEL, W. GRIFFIN, Philadelphia, Pa.  
KOPFER, W. B., Brooklyn, N. Y.  
KNAPP, F. H., Pittsburgh, Pa.  
LEWKE, F. A., Kalamazoo, Mich.  
LONG, H. J., New Brunswick, N. J.  
McDONALD, DONALD, New York, N. Y.  
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SEERWOOD, J. M., New York, N. Y.  
STITES, TOWNSEND, Gloucester, N. J.

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CHAPIN, C. H. B., New York, N. Y. (Empire State)  
ECCLES, GEO. W., Waltham, Mass. (N. E. Gas Eng.)  
GIBSON, W. R., Toronto, Can. (Canadian)  
KELSEY, L. D., Brookfield, Mo. (Missouri)  
LONG, H. J., New Brunswick, N. J. (New Jersey)  
McCULLOUGH, CHAS., Milwaukee, Wis. (Wisconsin)  
MILLER, THOS. D., Detroit, Mich. (Illinois)  
ROPER, GEORGE D., Rockford, Ill. (Iowa Dist.)  
SEIDENGLANZ, C. H., Dallas, Tex. (So. Central)  
SCHALL, H. D., Detroit, Mich. (Michigan)  
SPARKS, F. T., Chattanooga, Tenn. (Southern)  
WARREN, W. M., St. Louis, Mo. (Iowa Dist.)  
WESTON, J. A., Lansing, Mich. (Indiana)

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*Our prosperity is dependent upon the prosperity of those producing the gas utilized by our appliances—our interests are in common.*

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## The Logical Place to Buy

JOHN F. WEEDON, Advertising, Peoples' Gas Light and Coke Co., Chicago

IN a recent number of an advertising magazine a writer calls attention to the necessity of hammering hard on "the main idea."

What then, is the main idea for a gas company to convey to the gas appliance buying public?—Surely that the gas company is the logical place to buy such appliances.

Of course half a dozen reasons for this may occur to the gas man right off the bat but to the hesitating housekeeper, in the market for some gas appliance; who scans the advertisements of many merchants offering for sale the appliance she needs, these reasons may not be so obvious.

It is a self evident fact that a gas man who devotes his whole time solely to the

manufacture, distribution and consumption of gas, must naturally know more about the subject in all its branches, than the casual merchandizer of many wares.

The purchase of gas appliances is not a frequent necessity. Two or three ranges and perhaps one or two water heaters is the sole requirements of an average family for a life time. But if the sale is made by the gas company it is made to a steady customer with whom there are business transactions every month, and with whom the company desires to establish and maintain pleasant and peaceful relations.

The responsibility of the ordinary merchant ceases when the goods are delivered and paid for. If the appliance does not give satisfaction it is easy and

## A. G. A. MONTHLY

natural enough to pass the buck to the gas company.

One sometimes finds much ill-will toward the gas industry, which, when traced to its source, proves an inspiration resulting from some unsatisfactory gas appliance with which the gas company had nothing at all to do.

Such a case came under the observation of the writer recently. A visitor at a summer resort was soundly berating her local gas company, for the edification of the guests at the dinner table. A gas man happened to be present and as a result of his effort to localize the cause of her antipathy (really a mild word for the lady's vituperation) he discovered that it all arose from the fact that her gas range failed to function properly. Further inquiry revealed the fact that the range was a very old one, had been purchased at a department store originally, and also had been moved from a distant city to the place where the complainant now lived.

There can be no question but that a big contributing cause of much of the unreasoned ill feeling to gas companies is due to the large number of inefficient and unsatisfactory gas appliances in the homes of consumers, sold, no doubt, in perfect good faith, by merchants who failed to realize that the gas appliance industry is a highly specialized one.

It is therefore a highly important matter for gas companies to select and offer for sale only such appliances as have been carefully tested and tried in the locality in which they are to be used. A certain type of appliance may be popular and successful in Dallas, and a failure in

Delaware.—Gas companies cannot afford to risk failures.

Merchants are constantly talking about "satisfied customers;" they are the sine qua non of the whole goodwill account of a gas company.

Customer complaints are costly, directly and indirectly; the latter due to the fact that the dissatisfied one spreads dissatisfaction, as though it were a contagious disease, among his friends and acquaintances.

Unsatisfactory appliances in customers' homes are as great a menace to the prosperity of a gas company, as caterpillars are to a cabbage patch. Much money might profitably be spent inducing customers to change old and faulty appliances for new and approved ones.

The old fashioned smelly gas-log has left trailing behind it a miasmal fog of prejudice that even the brightest and best of our modern heating appliances finds it hard to dispel.

The remedy lies in extreme care in selecting appliances. Only such as can be recommended with the utmost confidence should be offered for sale. The company's gas appliances should be persistently and patiently advertised. Reasonable prices should be maintained, and the bargain hunting frame of mind discouraged. An assuredly good range at its right price is a bargain in itself. One cannot afford to take chances when buying any sort of a gas appliance.

Satisfactory results must surely follow this policy if they are properly pursued. Gas companies have a broader purpose than merely increasing sales and showing a big turn-over.

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## Some Conditions Affecting the Accuracy of the Determination of Volatile Matter in Coal and Coke

HAROLD J. ROSE\*

### COOPERATIVE ANALYTICAL WORK

*Coal is our most important raw material and for this reason our Chemical Committee has given a place of first importance to the analysis of coal and coke under a program of cooperative analytical work undertaken to promote the use of the most advanced testing methods in gas company laboratories. The following article by Mr. Rose brings out in striking manner some conditions essential to the proximate analysis of coal and coke if accuracy is to be obtained. It is hoped that other articles on this subject will be published as a result of the investigation now under way. Members of the Chemical profession are invited to set forth their ideas in these columns. The Editor.*

**T**HE purpose of this paper is to discuss certain conditions which may lead to serious errors in the determination of "volatile matter." These conditions may, and probably often do exist, in many gas plant and fuel testing labora-

tories, even though the analysts believe that they are following the standard A. S. T. M. methods<sup>1</sup> for volatile matter with reasonable fidelity. At the present time a great deal of work remains to be done before final conclusions are made,

\*The Koppers Company laboratories, Mellon Institute, Pittsburgh, Pa.

<sup>1</sup>American Society for Testing Materials "Standards 1918," pp. 687 to 689, and 714 to 716.

and this paper may be considered as a progress report which indicates conditions that need study. It is especially hoped that the interest of other fuel chemists will be aroused, and that they will co-operate in working out the necessary restrictions which apparently should be added to the standard methods.

As is well recognized, the term "Volatile Matter" does not represent any compound or group of compounds present in the coal before it is heated. For this reason an arbitrary method must be chosen for the determination of volatile matter, and no laboratory should use an unauthorized modification, no matter how insignificant it might appear to be.

There is no doubt that if the standard methods are strictly followed by a skilled and observing analyst and if the crucibles are kept in first class condition, that good volatile matter results can be consistently obtained, especially if an electric tube furnace is used. It is the writer's opinion, however, that in the case of certain samples such as "air dry" anthracite coal or coke, containing as much as three or four per cent of moisture, that the very best of conditions must prevail, and considerable attention be given, in order to be certain of satisfactory results.

The Chemical Committee of the American Gas Association recently submitted a series of typical coal and coke samples to a number of gas plant and fuel testing laboratories. While conducting these analyses, the writer became interested in investigating the effect of "mechanical losses" on the accuracy of the methods. By mechanical loss is meant the loss of fine particles of sample which may be carried out by the rush of gases and steam during the first two minutes of a volatile

matter determination. This effect is known as "sparking," since the particles are heated to incandescence as they pass through the heated zone around the crucible. The particles are partly burned to ash, but in serious cases, a considerable amount of the unburned sample may be recovered from the table top (in case the Meker burner method is used). Conclusive evidence that this material consists of actual particles of sample rather than of carbon from decomposed gases, lies in the fact that it gives abundant ash when ignited.

#### Effect of Fineness of Sample

It would be expected that the finest particles of sample would be carried out of the crucible more easily than coarser particles. To secure quantitative information on this point, two coke samples were selected—the one having about 0.9 per cent and the other about 5.5 per cent volatile matter. From each coke a 20 mesh sample was prepared by crushing between steel rolls, and a "200 mesh" sample was prepared by ballmilling 250 grams of coke for three hours in a one gallon Abbé pebble mill. The variation in fineness was purposely made excessive in order to more definitely show the variation in results. The following figures were obtained:—

Volatile matter determinations made on undried coke (1.31% to 3.06% moisture) but calculated to a dry basis.

Sample A.		Sample B.	
20 mesh	200 mesh	20 mesh	200 mesh
0.94 %	2.70 % +	5.39 % +	17.80 % ++
0.86 %	1.57 %	5.77 % +	11.08 % ++

Determinations made on dried samples.

+ Indicates small amount of mechanical loss or "sparking."  
 ++ Indicates large amount of mechanical loss or "sparking."

### Comments

1.—The conditions of test and apparatus used for the above work were as follows:

The A. S. T. M. Standard method for coke was followed, using double 10 cc. crucibles which were in excellent condition. Pittsburgh city gas (natural gas containing a small but variable percentage of blue water gas) was supplied to a standard type Meker burner at 11 cm. water pressure. The flame height was 13–14 cm. The bottom of the crucible was placed just above the small light blue cones at the base of the flame. The temperature inside the crucible at the center of the bottom was 940° C. (bare noble metal couple packed in ignited sand.) Potassium Chromate (M. P. 940° C.) melted in less than one minute under the conditions of the test.

2.—The effect of moisture will be discussed later.

3.—The above results indicate that it will be necessary for laboratories to realize that the 60 mesh analysis sample should be prepared in such a manner as to prevent the formation of an excessive amount of fine material. It will readily be seen that a laboratory preparing a "60 mesh" sample by ballmilling coke for an hour or two might secure results at wide variance with another laboratory which made the determination itself in an identical way, but prepared the sample by means of steel rolls, diamond steel mortar, (or in the case of coals, a bucking board).

4.—A discussion of the relative errors to be expected from mechanical losses, when various methods of heating are used, will be given later.

5.—There are other reasons which make it preferable to have samples of the specified fineness. For example, investigators working on coals have reported that the size of particles influences the ease with which gas is evolved.

### Effect of Moisture in Samples

The A. S. T. M. Volatile Matter method for Coal specifies the use of an air dried sample. (See the details of

sample preparation "Standards 1918"). Such a sample may contain up to 10 per cent or more of moisture.

The A. S. T. M. Volatile Matter method for Coke specifies the use of a sample which has been oven dried while in a coarsely ground state, but which has presumably picked up a few tenths per cent of moisture during the subsequent pulverization.

In the writer's laboratory, volatile matter determinations on coal and coke have always been made on samples dried at 105° C. The Meker burner method, substantially as described above, has been used on a wide variety of dried samples over a period of years, with very satisfactory results.

However, when the A. G. A. Chemical Committee samples of coke and anthracite coal, each containing from three to four per cent moisture, were tested in the same way, the results were invariably high and erratic, and it was impossible to secure satisfactory results. There was evidence of considerable mechanical loss. The simple expedient of drying the samples permitted the determination to be made easily and accurately. During this work, it occurred to the writer to investigate the effect when alcohol was added to the sample. It was considered that the wetting of the sample might tend to make it cohere more strongly, and thus prevent mechanical loss; it might be of value in removing the water from a moist sample, and of course might have an effect in reducing oxidation loss from air contained in the crucible. The use of kerosene or gasoline, etc., has been proposed and used by several investigators for the purpose of reducing oxidation losses, but the use



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of alcohol for the purposes mentioned above is new, so far as the writer knows. The results of the use of alcohol on moist samples far exceeded expectations.

Sparking was entirely prevented, and unusually close agreement was obtained on duplicate determinations. The following figures have been obtained:

All Results Reported on Dry Basis.

Samples		Undried samples but calc. to dry basis.		Dried samples	
		Standard method	Alcohol method	Standard method	Alcohol method
No. 1 gas coal (1.14 % moisture)		34.95	34.18		
		35.06	34.32		
	Average	35.00	34.25	---	---
No. 2 anthracite (3.15 % moisture)			4.88		
		8.37	4.87		
		7.17	4.94		
		6.55	4.74		4.84
		8.13	4.54++	4.94	5.25
		7.16	4.48++	4.94	4.50
	Average	7.48	4.74	4.94	4.86
No. 3 steam coal (10.19 % moisture)		41.66	40.69		
		41.55	40.27		
	Average	41.61	40.48	---	---
By-product coke (3.72 % moisture)		Double crucible			
		4.25			
		4.70			
		5.60		Double crucible	
		3.16	2.70		3.14
		3.92	2.60	2.60	3.17
		4.84	2.88+	2.45	3.14
	Average	4.41	2.73	2.53	3.15

+Determined with ethyl ether.

++Determinations made after sample had stood for a couple of months.

- NOTES: 1. The volatile matter determinations given above include work by four analysts using six 10 cc. crucibles.
2. In all cases where a double crucible is not specified in the table, a single crucible having a shallow but well fitting lid was used. This lid had a depression about  $\frac{5}{16}$  inch deep with straight sides. The Meker burner method, previously described, was used.
3. Method for Use of Alcohol: The 10 cc. crucible containing a one gram sample was tapped lightly on the table top to level and pack the sample, and alcohol was added with a medicine dropper. Enough liquid was used to thoroughly moisten the sample. Thirty drops of ethyl

alcohol are about right for bituminous coal and coke, while twenty drops seem to wet anthracite sufficiently. It is probable that the exact amount of liquid used is not important. The top of the crucible was then heated carefully with the Meker burner until alcohol vapors burned quietly around the edge of the lid. Then cautious heating from below was used in order to maintain a steady quiet flame. When the flames had nearly died away, the 7-minute heating period was begun, and carried out in the usual way. NOTE: The method just described was the first one tried, and gave satisfactory results on the first trial. No work has

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yet been done to determine the most favorable conditions for use, nor the effect given by various other organic liquids.

### Comments

1. In the case of determinations made on undried material, the use of alcohol gave lower results in every instance, and the effect is especially marked in the case of anthracite coal and coke. The greatest variation in duplicate runs by the standard method for anthracite was 1.82 per cent compared to a variation of 0.46 per cent by the use of alcohol. In the case of coke, the variation by the standard method was 2.44 per cent compared to 0.28 per cent for alcohol.
2. The use of dried analysis samples gave results which agreed with those obtained by using alcohol on moist samples. No consistent variation in results was noted.
3. The use of alcohol on dried samples seemed to present no advantage. Good results were not obtained with dry coke.
4. The conclusion drawn is that alcohol acts as a dehydrating agent, and helps the water to "steam out" during the preliminary warming up process. If this is true, and is its only effect, there would be no advantage in using alcohol on a moist sample, over the use of standard methods on a dried sample.
5. Alcohol seems to have a binding effect on the particles of sample, and thus undoubtedly helps to prevent mechanical loss.
6. A blank, using the regular amount of alcohol on a gram of ignited sea sand showed no change in weight after heating.
7. The use of A. S. T. M. volatile matter methods for coke and anthracite coal containing as much as 3 per cent of moisture does not appear to be permissible when the Meker burner method is used.

### Comparison of Meker Burner and Electric Tube Furnace

The above results were communicated to Dr. A. C. Fieldner of the U. S. Bureau

of Mines. In reply he pointed out that the Bureau of Mines has analyzed practically every variety of fuel, including those with an extreme range of moisture content, by the use of the electric tube furnace (the preferred method of heating specified by the A. S. T. M. methods) and ten cc. crucibles with inserted capsule covers. He also pointed out that gas burners tend to give more intense heating of the bottom of the crucible, which would tend to high mechanical loss, whereas the electric tube furnace heats the crucibles from the sides. He invited the writer to make determinations at the Bureau of Mines, using the electric tube furnaces, in order to check up on this detail. Through this kindness of Dr. Fieldner, and with the fullest cooperation from Mr. Cooper who is in charge of the Bureau's Coal Laboratory, the writer was able to spend about a day's time in securing results in the electric tube furnace.

Since the shallow type of crucible cover was too large to insert in the furnace, it was necessary to use the capsule type of cover for all work. A practically new 10 cc. crucible which was in perfect condition, was used for most of the work.

The following results were obtained on:

(Undried Anthracite Coal Sample (3.15 % Moisture But Results Calculated to Dry Basis.)

% Volatile matter	Remarks
5.84	The first determination that was made. No sparking was noticed.
5.25	A small amount of sparking.
6.35	Cover popped up at beginning of run. Sparking lasted for at least 30 seconds.
7.61	An old crucible in poor condition was used. There was continuous sparking for 70 seconds. It is

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probable that the cover did not fit tightly enough.

5.70 Check run in the same poor crucible. Very small amount of sparking.

5.42 Check run in same crucible by Bureau of Mines analyst. Very small amount of sparking.

Undried Coke Sample (3.72 Per Cent Moisture But Results Calculated to Dry Basis).

3.15 Perfect run except that furnace temperature was somewhat low. No sparking.

3.46 Perfect run. No sparking.

**NOTE:** The fit of the capsule cover was so tight that in two out of four trials on coke the cover blew off within about 20 seconds.

In considering the above results, it must be remembered that they are the work of an analyst working in a strange laboratory with unfamiliar equipment. Such results would not be as uniform as those obtained by an experienced operator. The writer rather hesitates to draw conclusions based on only a few hours experience, but will venture a few observations which represent his personal opinion after this brief opportunity to compare methods.

1. By using a *perfect crucible* and under the most favorable conditions, no mechanical loss could be observed in the electric furnace. This probably represents a decided advantage of the electric tube furnace over the Meker burner.
2. By using a crucible in good condition, in which a fairly good fit of lid was obtained (that is, good, practical, working conditions) a slight amount of mechanical loss was observed, but the loss was within present permissible checking limits.
3. A large error could be introduced by loss, due to poorly fitting lids, which might be entirely overlooked by the analyst, especially since the determination is not,

\*This figure is 0.44 per cent lower than that obtained by the Koppers Company Laboratory on their sample. A single check determination made by the Bureau of Mines on the Koppers sample gave 3.60 per cent moisture, which may indicate that the two samples had a somewhat different moisture content when analyzed.

in practice, so easily watched as a Meker burner determination.

The volatile matter figures obtained by U. S. Bureau of Mines on the A. G. A. Coal and Coke Samples are given below, with the permission of Dr. Fieldner. They are reported on dry basis, but the moisture content of the original sample as determined by the Bureau of Mines is also given, since this affects the volatile matter figures.

	Moisture.	Volatile matter
No. 1 Gas coal	1.08	35.45
No. 2 Anthracite	3.18	4.92
No. 3 Steam coal	9.90	41.99
By-product coke	3.28*	2.89

It is interesting to note that the Meker burner method using shallow lidded crucibles gave results on coking coals which are in agreement with the electric furnace results of the Bureau of Mines.

An important fact is that the alcohol method on undried samples gives, in all four cases, results distinctly lower than either the Bureau of Mines electric furnace results on moist samples, or the Meker burner method on dry samples. Further work should certainly be done to determine whether this lower figure is more nearly accurate than is obtained by present methods.

It may be possible by the use of alcohol or some similar modification, for various laboratories working with different types of equipment and on moist or dry samples, to secure results in much better agreement than can be obtained at present. This would be desirable, for under existing conditions, it has been found necessary to accept a "permissible error" for volatile matter that is at least twice as great as for the other regular determinations made on coal samples.

# Associations Affiliated with A. G. A.

## Canadian Gas Association

Date of Affiliation—Mar. 25, 1919  
 Pres.—C. S. Bagg, Montreal Light, Heat & Power Co., Montreal, Que.  
 Sec.-Tr.—G. W. Allen, Consumers' Gas Co., Toronto  
 Conv., 1922

## Empire State Gas and Electric Association

Date of Affiliation—Nov. 21, 1919  
 Pres.—E. H. Rosenquest, Bronx Gas & Electric Co., Bronx, N. Y.  
 Sec.—C. H. B. Chapin, Grand Central Terminal, New York, N. Y.  
 Conv., 1922.

## Illinois Gas Association

Date of Affiliation—Mar. 19, 1919  
 Pres.—H. H. Clark, 325 Peoples Gas Bldg., Chicago, Ill.  
 Sec.-Tr.—R. V. Prather, DeWitt-Smith Bldg., Springfield, Ill.  
 Conv., 1922

## Indiana Gas Association

Date of Affiliation—April 24, 1919  
 Pres.—Morse Dell Plain, No. Indiana Gas & Elec. Co., Hammond, Ind.  
 Sec.-Tr.—E. J. Burke, Citizens Gas Co., Indianapolis, Ind.  
 Conv., 1922

## Iowa District Gas Association

Date of Affiliation—May 21, 1919  
 Pres.—C. N. Chubb, United Light & Rwy. Co., Davenport, Ia.  
 Sec.-Tr.—H. R. Sterrett, Des Moines Gas Co., Des Moines, Ia.  
 Conv., 1922

## Michigan Gas Association

Date of Affiliation—Sept. 18, 1919  
 Pres.—J. A. Brown, Hodenpyl, Hardy & Co., Jackson Mich.  
 Sec.-Tr.—A. G. Schroeder, Grand Rapids Gas Light Co., Grand Rapids, Mich.  
 Conv., 1922.

## Missouri Association of Public Utilities

Date of Affiliation—June 18, 1920  
 Pres.—H. Spoecher, Union Elec. Lt. & Pr. Co., St. Louis, Mo.  
 Sec.-Tr.—F. D. Beardslee, 315 N. 12th St., St. Louis, Mo.  
 Wiley F. Corl, Chmn. Affiliation Com., Missouri Utilities Co., Mexico, Mo.  
 Conv., 1922

## New England Association of Gas Engineers

Date of Affiliation—Feb. 19, 1919  
 Pres.—Burton Smart, Portland Gas Lt. Co., Portland, Me.  
 Sec.-Tr.—J. L. Tudbury, Salem Gas Light Co., Salem, Mass.  
 Conv., 1922

## Gas Sales Association of New England

Date of Affiliation—Oct. 1, 1919  
 Gov.—H. J. Pettengill, Jr., Blackstone Valley Gas & Electric Co., Pawtucket, R. I.  
 Sec.—M. Bernard Webber, 150 Congress St., Boston, Mass.  
 Annual Meeting, 1922

## New Jersey Gas Association

Date of Affiliation—April 25, 1919  
 Pres.—H. H. Newman, Public Service Gas Co., Trenton, N. J.  
 Sec.-Tr.—H. E. Mason, Consolidated Gas Co. of N. J., Long Branch, N. J.  
 Conv., 1922

## Pacific Coast Gas Association

Date of Affiliation—Sept. 18, 1919  
 Pres.—Henry Bostwick, Pacific Gas & Electric Co., San Francisco, Cal.  
 Sec.-Tr.—W. M. Henderson, 812 Howard St., San Francisco, Cal.  
 Conv.—Santa Barbara, Cal., September, 1922.

## Pennsylvania Gas Association

Date of Affiliation—April 10, 1919  
 Pres.—E. L. Smith, Towanda Gas Co., Towanda, Pa.  
 Sec.-Tr.—Geo. L. Cullen, Harrisburg Gas Co., Harrisburg, Pa.  
 Conv., 1922

## South Central Gas Association

Date of Affiliation—Oct. 15, 1919  
 Pres.—Frank L. Weisser, San Antonio Public Service Co., San Antonio, Texas.  
 Acting Sec.-Tr.—C. H. Seidenglanz, 1501 Commerce St., Dallas, Tex.  
 Conv. 1922

## Southern Gas Association

Date of Affiliation—May 20, 1919  
 Pres.—L. I. Pollitt, Southern Gas & Electric Corp., Lexington Bldg., Baltimore, Md.  
 Sec.-Tr.—G. H. Smith, City Gas Co., Norfolk, Va.  
 Conv., 1922

## Wisconsin Gas Association

Date of Affiliation—Mar. 25, 1919  
 Pres.—J. P. Pulliam, Wisconsin Public Service Co., Milwaukee, Wis.  
 Sec.-Tr.—Henry Harman, 182 Wisconsin St., Milwaukee, Wis.  
 Conv., 1922

## OTHER ASSOCIATIONS

### Natural Gas Association of America

Pres.—L. B. Denning, Pittsburgh, Pa.  
 Sec.-Tr.—Wm. B. Way, 904-5 Oliver Bldg., Pittsburgh, Pa.  
 Conv., 1922

### Society of Gas Lighting

Pres.—Alex. H. Strecker, Newark, N. J.  
 V.-Pres.—W. Cullen Morris  
 Sec.—Geo. G. Ramsdell, 130 E. 15th St., New York, N. Y.  
 Treas.—Wm. J. Welsh  
 Conv., Dec. 8, 1921, New York, N. Y.

### Southwestern Electrical and Gas Association

Pres.—A. Hardgrave, Dallas, Tex.  
 Sec.—H. S. Cooper, Slaughter Bldg., Dallas, Texas  
 Treas.—J. B. Walker  
 Conv., 1922

# Classified Directory--Manufacturers of Gas Equipment

Company Members Only, American Gas Association, Inc.

## ARC LAMPS (Gas)

General Gas Light Co., New York, N. Y., and  
Kalamazoo, Mich.  
Johnson Gas Appliance Co., Cedar Rapids, Iowa  
Weisbach Co., Gloucester, N. J.

## ASBESTOS AND MAGNESIA PRODUCTS

Johns-Manville Inc., Madison Ave. and 41st St.,  
New York, N. Y.

## BAGS (Gas Main)

Safety Gas Main Stopper Co., 943 Fulton St.,  
Brooklyn, N. Y.

## BENCHES

J. H. Gautier & Co., Jersey City, N. J.  
Riter-Conley Company, Pittsburgh, Pa.  
Russell Engineering Co., St. Louis, Mo.  
The Bartlett Hayward Co., Baltimore, Md.  
The Parker-Russell Mining & Mfg. Co., St. Louis,  
Mo.  
The Gas Machinery Co., Inc., Cleveland, Ohio  
The U. G. I. Contracting Co., Broad & Arch Sts.,  
Philadelphia, Pa.

## BENCH IRON WORK

Banner Iron Works, 4560 Shaw Ave., St. Louis,  
Mo.  
Davis & Farnum Mfg. Co., Waltham, Mass.  
Isbell-Porter Co., Newark, N. J.  
Riter-Conley Company, Pittsburgh, Pa.  
Russell Engineering Co., St. Louis, Mo.  
The Bartlett Hayward Co., Baltimore, Md.  
The Gas Machinery Co., Cleveland, Ohio  
The Improved Equipment Co., 60 Wall St., New  
York, N. Y.  
The Parker-Russell Mining & Mfg. Co., St.  
Louis, Mo.  
The Stacy Manufacturing Co., Cincinnati, Ohio  
The Western Gas Construction Co., Fort Wayne,  
Ind.

## BOILERS (Gas)

Wm. M. Crane Co., 16 W. 32d St., New York,  
N. Y.  
Gallagher Boiler Co., Laclede Gas Bldg., St.  
Louis, Mo.  
General Gas Appliance Co., 103 Park Ave., New  
York, N. Y.  
Hugo Manufacturing Co., West Duluth, Minn.  
Kidde & Co., 103 Park Ave., New York, N. Y.  
National Machine Works, Sheffield & North Aves.,  
Chicago, Ill.  
The Ofeldt Gas Fired Boiler Co., Inc., Nyack-on-  
the-Hudson, N. Y.  
The Bryant Heater Mfg. Co., Cleveland, Ohio,  
and Chicago, Ill.  
The Improved Appliance Co., 419 Kent Ave.,  
Brooklyn, N. Y.  
The Wales Co., Kalamazoo, Mich.

## BOILERS (Gas for House Heating)

American Radiator Co., New York, N. Y., and  
Chicago, Ill.  
Dodd Heating Systems Limited, Toronto, Ont.  
Gallagher Boiler Co., Laclede Gas Bldg., St.  
Louis, Mo.  
The Bryant Heater & Mfg. Co., Cleveland, Ohio,  
Kidde & Co., 103 Park Ave., New York, N. Y.,  
and Chicago, Ill.

## BOILERS (Waste Heat)

The Bartlett Hayward Co., Baltimore, Md.

The U. G. I. Contracting Co., Broad & Arch Sts.,  
Philadelphia, Pa.

## BLOWERS, BOOSTERS, EXHAUSTERS

Connolly Iron Sponge & Governor Co., 227 Fulton  
St., New York, N. Y.  
Gas Engineering Co., Ingram Ave., Trenton,  
N. J.  
Isbell-Porter Co., Newark, N. J.  
Maxon Furnace and Engineering Co., Muncie,  
Ind.  
The Connersville Blower Co., Connersville, Ind.  
The Needham Gas Appliance Co., 1 S. Lafayette  
St., New York City.  
The Gas Machinery Co., Cleveland, Ohio  
The Improved Appliance Co., 419 Kent Ave.,  
Brooklyn, N. Y.  
The C. M. Kemp Mfg. Co., Baltimore, Md.  
Monarch Engineering & Mfg. Co., American  
Bldg., Baltimore, Md.  
B. F. Sturtevant Company, Hyde Park District,  
Boston, Mass.  
The Surface Combustion Co., 366 Gerard Ave.,  
Bronx, N. Y.  
The U. G. I. Contracting Co., Broad & Arch Sts.,  
Philadelphia, Pa.  
The Western Gas Construction Co., Fort Wayne,  
Ind.  
Wilbraham-Green Blower Co., Pottstown, Pa.  
L. J. Wing Mfg. Co., 362 West 13th St., New  
York, N. Y.

## BRAZING TABLES

Rathbone, Sard & Co., Albany, N. Y.  
The Improved Appliance Co., 419 Kent Ave.,  
Brooklyn, N. Y.

## BRICK, FIREBRICK

Gas Machinery Co., Cleveland, Ohio.  
J. H. Gautier & Co., Jersey City, N. J.  
Harbison-Walker Refractories Co., Pittsburgh, Pa.  
Improved Equipment Co., New York, N. Y.  
The Parker-Russell Mining & Mfg. Co., St. Louis,  
Mo.  
Missouri Fire Brick Co., St. Louis, Mo.  
Russell Engineering Co., St. Louis, Mo.

## BRAKE AND FRICTION MATERIALS

Johns-Manville Inc., Madison Ave. and 41st St.,  
New York, N. Y.

## BROILERS (Hotel)

American Stove Co., St. Louis, Mo.  
Geo. M. Clark & Co., Div., Chicago, Ill.  
Wm. M. Crane Co., 16 W. 32d St., New York,  
N. Y.  
The De Matteis Broiler System Co., Inc., New  
York, N. Y.  
Geo. D. Roper Corp., Rockford, Ill.  
Rathbone, Sard & Co., Albany, N. Y.  
The Michigan Stove Co., Detroit, Mich.

## BURNERS (Industrial)

American Gas Appliance Co., 108 Lawrence St.,  
Brooklyn, N. Y.  
American Gas Furnace Co., 24 John St., New  
York, N. Y.  
Century Stove & Mfg. Co., Johnstown, Pa.  
Wm. M. Crane Co., 16 W. 32d St., New York,  
N. Y.  
Equitable Meter Co., Pittsburgh, Pa.  
Grinnell Co., Inc., Providence, R. I.  
General Gas Appliance Co., 103 Park Ave., New  
York, N. Y.  
Charles A. Hones, Inc., Baldwin, Long Island,  
N. Y.



## A. G. A. MONTHLY

### BURNERS (Industrial)—(Continued)

Hale Manufacturing Co., Chicago, Ill.  
Hugo Manufacturing Co., West Duluth, Minn.  
Johnson Gas Appliance Co., Cedar Rapids, Iowa  
The Maxon Furnace & Engineering Co., Muncie, Ind.  
National Machine Works, Sheffield & North Aves., Chicago, Ill.  
Needham Gas Appliance Co., 1 S. Lafayette St., New York City.  
Tate-Jones & Co., Inc., 50 Church St., New York, N. Y.  
The Baltimore Gas Appliance & Mfg. Co., Baltimore, Md.  
The Eclipse Stove Co., Mansfield, Ohio  
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.  
The C. M. Kemp Mfg. Co., Baltimore, Md.  
Monarch Engineering & Mfg. Co., American Bldg., Baltimore, Md.  
Geo. D. Roper Corp., Rockford, Ill.  
The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.  
The A. H. Wolff Gas Radiator Co., 4 Great Jones St., New York, N. Y.

### BURNERS (Lighting)

Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.  
General Gas Light Co., New York, N. Y., and Kalamazoo, Mich.  
Johnson Gas Appliance Co., Cedar Rapids, Iowa  
Lindsay Light Co., New York—Chicago  
Welsbach Co., Gloucester, N. J.

### BY-PRODUCT OVENS

Andrews Engineering Co., Inc., Chicago, Ill.  
By-Product Coke Corp., Chicago, Ill.  
Foundation Oven Corporation, Woolworth Building, New York, N. Y.  
Semet-Solvay Co., Syracuse, N. Y.  
The Gas Machinery Co., Cleveland, Ohio  
The Improved Equipment Co., 60 Wall St., New York, N. Y.  
The Koppers Co., Pittsburgh, Pa.  
The Parker-Russell Mining & Mfg. Co., St. Louis, Mo.

### BY-PRODUCT RECOVERY APPARATUS

Foundation Oven Corporation, Woolworth Building, New York, N. Y.  
Isbell-Porter Co., Newark, N. J.  
The Bartlett Hayward Co., Baltimore, Md.  
The Gas Machinery Co., Cleveland, Ohio  
The Koppers Co., Pittsburgh, Pa.  
The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.  
The Western Gas Construction Co., Fort Wayne, Ind.

### CALORIMETERS

American Meter Co., Inc., New York, N. Y.  
Lambert Meter Co., Inc., Bush Terminal Bldg., Brooklyn, N. Y.  
Maryland Meter Works, Baltimore, Md.  
D. McDonald & Co., Albany, N. Y.  
Nathaniel Tufts Meter Works, 455 Commercial St., Boston, Mass.  
Superior Meter Co., Brooklyn, N. Y.

### CASING, TUBING (Steel)

National Tube Co., Frick Bldg., Pittsburgh, Pa.

### CASTINGS (Grey Iron)

Banner Iron Works, 4560 Shaw Ave., St. Louis, Mo.  
The Bartlett Hayward Co., Baltimore, Md.  
The Western Gas Construction Co., Fort Wayne, Ind.

### CEMENT, HIGH TEMPERATURE

Quigley Furnace Specialties Co., 26 Cortlandt St., New York, N. Y.

### CHARGING COAL

Isbell-Porter Co., Newark, N. J.  
Phillips, Lang & Co., Chicago, Ill.  
The Bartlett Hayward Co., Baltimore, Md.  
The Gas Machinery Co., Cleveland, Ohio  
The Western Gas Construction Co., Fort Wayne, Ind.

### CLOTHES DRYERS

The Canton Clothes Dryer Co., Canton, O.

### CHIMNEYS (Radial Brick)

Alphons Custodis Chimney Construction Co., Marquette Bldg., Chicago, Ill.

### COAL AND COKE (Conveyors, Crushers, Screeners)

R. H. Besumont Co., 315 Arch St., Philadelphia, Pa.

Ritter-Conley Company, Pittsburgh, Pa.

Stephens-Adamson Mfg. Co., Aurora, Ill.

Isbell-Porter Co., Newark, N. J.

Phillips, Lang & Co., Chicago, Ill.

The Bartlett Hayward Co., Baltimore, Md.

The Gas Machinery Co., Cleveland, Ohio

The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.

### COAL TAR PRODUCTS & CHEMICALS

The Barrett Company, 17 Battery Place, New York, N. Y.

### COCKS (Ranges, Water Heaters, Service and Meter)

A-B Stove Co., Battle Creek, Mich.

Acme Brass Works, Detroit, Mich.

Claus Automatic Gas Cock Co., Milwaukee, Wis.

Hays Mfg. Co., Inc., Erie, Pa.

Johnson Gas Appliance Co., Cedar Rapids, Iowa

Kitson Co., 2837 Oakford St., Philadelphia, Pa.

The McRae-Roberts Co., Detroit, Mich.

H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.

Peninsular Brass Works, Detroit, Mich.

Standard Brass Works, Detroit, Mich.

The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.

The Roberts Brass Mfg. Co., Detroit, Mich.

Geo. D. Roper Corp., Rockford, Ill.

### COMPOUND FOR CLEANING GAS METERS

AND GAS STOVES  
Standard Chemical & Supply Co., Cambridge A. Mass.

### COMPRESSORS

The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.

The C. M. Kemp Mfg. Co., Baltimore, Md.

The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.

### CONDENSERS

Cruise-Kemper Co., Ambler, Pa.

M. T. Davidson Co., 154 Nassau St., New York, N. Y.

Davis & Farnum Mfg. Co., Waltham, Mass.

Gas Engineering Co., Ingram Ave., Trenton, N. J.

Isbell-Porter Co., Newark, N. J.

Ritter-Conley Company, Pittsburgh, Pa.

Secere Engineering Co., Detroit, Mich.

The Bartlett Hayward Co., Baltimore, Md.

The Gas Machinery Co., Cleveland, Ohio

The Stacey Manufacturing Co., Cincinnati, Ohio

The Stacey Bros. Gas Construction Co., Cincinnati, Ohio

The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.

The Western Gas Construction Co., Fort Wayne, Ind.

### COOKING AUXILIARIES

Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.

Duparquet, Huot & Monrose Co., 108 W. 32nd St., New York, N. Y.

Johnson Gas Appliance Co., Cedar Rapids, Iowa

The G. S. Blodgett Co., Burlington, Vt.

The General Gas Appliance Co., 103 Park Ave., New York, N. Y.

The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.

Geo. D. Roper Corp., Rockford, Ill.

The Scott Gas Appliance Co., 1311 E. St., N. W., Washington, D. C.

### COUPLINGS

S. R. Dresser Mfg. Co., Bradford, Pa.

### COVERINGS (cold pipe, steam pipe, tank and boiler)

Armstrong Cork Co., Pittsburgh, Pa.

John-Manville Inc., Madison Ave. and 41st St., New York, N. Y.

## A. G. A. MONTHLY

### CYLINDERS (Pressure)

National Tube Co., Frick Bldg., Pittsburgh, Pa.

### DECALCOMANIA PRODUCTS

The Meyercord Co., Inc., Chamber of Commerce Bldg., Chicago, Ill.

### ELECTRIC CONTROLLING DEVICES

The Cutler-Hammer Mfg. Co., Milwaukee, Wis.

### ELEVATORS

Craig Ridgway & Son Co., Costesville, Pa.  
Phillips, Lang & Co., Chicago, Ill.

### EXCHANGES (Heat)

The Bartlett Hayward Co., Baltimore, Md.  
Riter-Conley Company, Pittsburgh, Pa.  
The Western Gas Construction Co., Fort Wayne, Ind.

### EXPERT APPRAISAL

Steele Engineering Co., Detroit, Mich.  
The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.

### EXTRACTORS (Tar, Dust, Fumes)

Gas Engineering Co., Ingram Ave., Trenton, N. J.  
Isbell-Porter Co., Newark, N. J.  
The Bartlett Hayward Co., Baltimore, Md.  
The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.  
The Western Gas Construction Co., Fort Wayne, Ind.

### FITTINGS

A-B Stove Co., Battle Creek, Mich.  
Acme Brass Works, Detroit, Mich.  
Awa Manufacturing Co., New York, N. Y.  
Banner Iron Works, 4560 Shaw Ave., St. Louis, Mo.  
Claus Automatic Gas Cock Co., Milwaukee, Wis.  
Davis & Farnum Mfg. Co., Waltham, Mass.  
S. R. Dresser Mfg. Co., Bradford, Pa.  
Eriez Stove & Mfg. Co., Erie, Pa.  
Grinnell Co., Inc., Providence, R. I.  
Kitson Co., 2827 Oakford St., Philadelphia, Pa.  
The McRae & Roberts Co., Detroit, Mich.  
H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.  
Peninsular Brass Works, Detroit, Mich.  
Standard Brass Works, Detroit, Mich.  
The Bartlett Hayward Co., Baltimore, Md.  
The Gas Machinery Co., Cleveland, Ohio  
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.  
Geo. D. Roper Corp., Rockford, Ill.  
The Roberts Brass Mfg. Co., Detroit, Mich.  
The Western Gas Construction Co., Fort Wayne, Ind.  
Welsbach Co., Gloucester, N. J.

### FITTINGS (Malleable Iron)

Detroit Brass & Malleable Works, Detroit, Mich.  
Geo. D. Roper Corp., Rockford, Ill.

### FLEXIBLE TUBING AND ENDS

Atlantic Tubing Co., Providence, R. I.  
Eastman Mfg. Co., Manitowoc, Wis.  
Wm. M. Crane Co., 16 W. 33d St., New York, N. Y.

### FLASHLIGHTS AND BATTERIES

Will W. Barnes, Tucson, Ariz.  
Diamond Electric Specialties Corp., Newark, N. J.  
French Battery & Carbon Co., Madison, Wis.  
Novo Mfg. Co., 424 W. 33d St., New York, N. Y.

### FUEL BRIQUETTING

Foundation Oven Corporation, Woolworth Building, New York, N. Y.

### FURNACES

American Gas Furnace Co., 24 John St., New York, N. Y.  
Century Stove & Mfg. Co., Johnstown, Pa.

Eriez Stove & Mfg. Co., Erie, Pa.  
Charles A. Honce, Inc., Baldwin, Long Island, N. Y.

Johnson Gas Appliance Co., Cedar Rapids, Iowa  
Maxon Furnace and Engineering Co., Muncie, Ind.

National Machine Works, Sheffield & North Aves., Chicago, Ill.

Needham Gas Appliance Co., Inc., 1 S. Lafayette St., New York, N. Y.

Russell Engineering Co., St. Louis, Mo.  
Tate-Jones & Co., Inc., 50 Church St., New York, N. Y.

The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.

The Parker-Russell Mining & Mfg. Co., St. Louis, Mo.

The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.

Monarch Engineering & Mfg. Co., American Bldg., Baltimore, Md.

### FUSES

Johns-Manville Co., Madison Ave. and 41st St., New York, N. Y.

### GAS COAL PRODUCERS

Harlan Co-operative Coal Co., Lexington, Ky.

### GAS ENGINES

The Bartlett Hayward Co., Baltimore, Md.

### GAS ENGINE COCKS AND VALVES

Standard Brass Works, Detroit, Mich.

### GAS IRONS

A-B Stove Co., Battle Creek, Mich.  
Wm. M. Crane Co., 16 W. 33d St., New York, N. Y.  
Johnson Gas Appliance Co., Cedar Rapids, Iowa  
Milwaukee Gas Specialty Co., Milwaukee, Wis.  
Benson Mfg. Co., Chicago, Ill.  
Strause Gas Iron Co., Philadelphia, Pa.

### GAS LEAK INDICATORS

Taylor Instrument Companies, Rochester, N. Y.

### GAS LOGS

Will W. Barnes, Tucson, Ariz.  
Strait & Richards, Inc., Newark, N. J.

### GAS MAIN BAGS AND GAS MAIN STOPPERS

Connelly Iron Sponge & Governor Co., 227 Fulton St., New York, N. Y.

### GAS MIXERS

American Gas Furnace Co., 24 John St., New York, N. Y.  
Century Stove & Mfg. Co., Johnstown, Pa.  
Wm. M. Crane Co., 16 W. 33d St., New York, N. Y.  
Eriez Stove & Mfg. Co., Erie, Pa.  
Grinnell Co., Inc., Providence, R. I.  
Hays Mfg. Co., Inc., Erie, Pa.  
Improved Appliance Co., Inc., 419 Kent Ave., Brooklyn, N. Y.  
Hale Manufacturing Co., Chicago, Ill.  
Johnson Gas Appliance Co., Cedar Rapids, Iowa  
Maxon Furnace & Engineering Co., Muncie, Ind.  
Strait & Richards, Inc., Newark, N. J.  
Tate-Jones & Co., Inc., 50 Church St., New York, N. Y.  
The C. M. Kemp Mfg. Co., Baltimore, Md.  
Monarch Engineering & Mfg. Co., American Bldg., Baltimore, Md.  
Geo. D. Roper Corp., Rockford, Ill.  
The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.

### GAS PLANTS (Blue)

Gas Engineering Co., Ingram Ave., Trenton, N. J.  
The Gas Machinery Co., Cleveland, Ohio  
The Bartlett Hayward Co., Baltimore, Md.  
The Improved Equipment Co., 60 Wall St., New York, N. Y.  
The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.

## A. G. A. MONTHLY

The Western Gas Construction Co., Fort Wayne, Ind.

### GAS PLANTS (OIL)

The Bartlett Hayward Co., Baltimore, Md.

### GAS PLANTS (Carbureted Water)

Gas Engineering Co., Ingram Ave., Trenton, N. J.  
The Bartlett Hayward Co., Baltimore, Md.  
Gas Machinery Co., Cleveland, Ohio  
The Improved Equipment Co., 60 Wall St., New York, N. Y.  
The Stacey Manufacturing Co., Cincinnati, Ohio  
The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.  
The Western Gas Construction Co., Fort Wayne, Ind.

### GAS PLANTS (Coal) (Engineers)

Davis & Farnum Mfg. Co., Waltham, Mass.  
Gas Engineering Co., Ingram Ave., Trenton, N. J.  
Isbell-Porter Co., Newark, N. J.  
National Machine Works, Sheffield & North Aves., Chicago, Ill.  
Riter-Conley Company, Pittsburgh, Pa.  
Russell Engineering Co., St. Louis, Mo.  
Smet-Solvay Co., Syracuse, N. Y.  
Sterne Engineering Co., Detroit, Mich.  
The Bartlett Hayward Co., Baltimore, Md.  
The Gas Machinery Co., Cleveland, Ohio  
The Improved Equipment Co., 60 Wall St., New York, N. Y.  
The Parker-Russell Mining & Mfg. Co., St. Louis, Mo.  
The Stacey Manufacturing Co., Cincinnati, Ohio  
The Stacey Bros. Gas Construction Co., Cincinnati, Ohio  
The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.  
The Western Gas Construction Co., Fort Wayne, Ind.

### GAS RANGE WATER HEATERS

Elliott Water Heater Co., Inc., 1246 Myrtle Ave., Brooklyn, N. Y.

Geo. D. Roper Corp., Rockford, Ill.

### GOVERNORS, PRESSURE VACUUM & PUMP

Connolly Iron Sponge & Governor Co., 227 Fulton St., New York, N. Y.

### HEATERS (Room)

American Stove Co., St. Louis, Mo.  
Century Stove & Mfg. Co., Johnstown, Pa.  
Geo. M. Clark & Co. Div., Chicago, Ill.  
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.  
Detroit Stove Works, Detroit, Mich.  
Eclipse Gas Stove Co., Rockford, Ill.  
Eriez Stove & Mfg. Co., Erie, Pa.  
Estate Stove Co., Hamilton, Ohio  
General Gas Light Co., New York, N. Y., and Kalamazoo, Mich.

Grinnell Co., Inc., Providence, R. I.  
The J. H. Grayson Mfg. Co., Athens, Ohio  
Hugo Manufacturing Co., West Duluth, Minn.  
Illinois Specialty Mfg. Co., Bloomington, Ill.  
Kidde & Co., 103 Park Ave., New York, N. Y.  
Kennedy-Toombs, Inc., 12 Eleventh Ave., New York, N. Y.

Lawson Mfg. Co., Pittsburgh, Pa.  
New Process Stove Co. Div., Cleveland, Ohio  
Reliable Stove Co. Div., Cleveland, Ohio  
Reznor Mfg. Co., Mercer, Pa.  
Roberts & Mander Stove Co., Philadelphia, Pa.  
J. B. Sattery & Bro. Inc., 108-110 Lawrence St., Brooklyn, N. Y.

Strait & Richards, Inc., Newark, N. J.  
The Baltimore Gas Appliance & Mfg. Co., Baltimore, Md.

The Ohio State Stove & Mfg. Co., Columbus, Ohio.  
The Sanitary Heating Co., 233 37th St., Brooklyn, N. Y.

Van Zandt Gas Appliance Co., 4050 Olive St., St. Louis, Mo.

The Western Gas Construction Co., Fort Wayne, Ind.  
Wheeling Corrugating Co., Wheeling, W. Va.

The A. H. Wolff Gas Radiator Co., 4 Great Jones St., New York, N. Y.  
Welshbach Co., Gloucester, N. J.

### HEATERS (Garage)

Gallagher Boiler Co., Laclede Gas Bldg., St. Louis, Mo.  
Kidde & Co., 103 Park Ave., New York, N. Y.  
The Wales Co., Kalamazoo, Mich.

### HEATERS (Pressing and Soldering Irons)

American Stove Co., St. Louis, Mo.  
Geo. M. Clark & Co. Div., Chicago, Ill.  
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.  
Eclipse Gas Stove Co., Rockford, Ill.  
Estate Stove Co., Hamilton, Ohio  
General Gas Appliance Co., 103 Park Ave., New York, N. Y.  
Charles A. Hones, Inc., Baldwin, Long Island, N. Y.

Johnson Gas Appliance Co., Cedar Rapids, Iowa  
Strait & Richards, Inc., Newark, N. J.  
The Bryant Heater & Mfg. Co., Cleveland, Ohio, and Chicago, Ill.

The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.

### HIGH PRESSURE SYSTEMS

Connolly Iron Sponge & Governor Co., 227 Fulton St., New York, N. Y.  
Grinnell Co., Inc., Providence, R. I.  
H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.  
Needham Gas Appliance Co., Inc., 1 S. Lafayette St., New York City.  
Selas Co., 321 W. 23d St., New York, N. Y.  
The Connersville Blower Co., Connersville, Ind.  
The Gas Machinery Co., Cleveland, Ohio  
The C. M. Kemp Mfg. Co., Baltimore, Md.  
The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.

### HOLDERS (Structural Steel Works))

Banner Iron Works, 4560 Shaw Ave., St. Louis, Mo.  
Cruse-Kemper Co., Ambler, Pa.  
Davis & Farnum Mfg. Co., Waltham, Mass.  
Gas Engineering Co., Ingram Ave., Trenton, N. J.  
Riter-Conley Company, Pittsburgh, Pa.  
The Bartlett Hayward Co., Baltimore, Md.  
The Stacey Bros. Gas Construction Co., Cincinnati, Ohio  
The Stacey Manufacturing Co., Cincinnati, Ohio  
The Western Gas Construction Co., Fort Wayne, Ind.

### HOT PLATES

American Stove Co., St. Louis, Mo.  
A-B Stove Co., Battle Creek, Mich.  
Century Stove & Mfg. Co., Johnstown, Pa.  
Geo. M. Clark & Co. Div., Chicago, Ill.  
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.

Detroit Stove Works, Detroit, Mich.  
Eclipse Gas Stove Co., Rockford, Ill.  
Eriez Stove & Mfg. Co., Erie, Pa.  
General Gas Appliance Co., 103 Park Ave., New York, N. Y.

Rathbone, Sard & Co., Albany, N. Y.  
J. B. Sattery & Bro., Inc., 108-110 Lawrence St., Brooklyn, N. Y.

The Baltimore Gas Appliance & Mfg. Co., Baltimore, Md.

The Eclipse Stove Co., Mansfield, Ohio  
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.

The Michigan Stove Co., Detroit, Mich.  
The A. H. Wolff Gas Radiator Co., 4 Great Jones St., New York, N. Y.

The Ohio State Stove & Mfg. Co., Columbus, Ohio

Union Stove Works, 30 Beckman St., New York, N. Y.

Weir Stove Co., Taunton, Mass.

Wheeling Corrugating Co., Wheeling, W. Va.

## A. G. A. MONTHLY

### INDUSTRIAL FLOORING

Johns-Manville Inc., Madison Ave. and 41st St., New York, N. Y.

### IRONING MACHINES

American Ironing Machine Co., 168 N. Michigan Ave., Chicago, Ill.

### INCINERATORS

Estate Stove Co., Hamilton, Ohio  
Odorless Incinerator Co., Philadelphia, Pa.  
Ruud Mfg. Co., Pittsburgh, Pa.

### INSTRUMENTS (Measuring, Testing and Recording)

American Meter Co., Inc., New York, N. Y.  
Bacharach Industrial Instrument Co., Pittsburgh, Pa.

Bailey Meter Co., Cleveland, Ohio  
The Bristol Company, Waterbury, Conn.  
Connelly Iron Sponge & Governor Co., 227 Fulton St., New York, N. Y.

Equitable Meter Co., Pittsburgh, Pa.  
The Foxboro Co., Inc., Foxboro, Mass.  
Lambert Meter Co., Inc., Bush Terminal Bldg., Brooklyn, N. Y.

D. McDonald & Co., Albany, N. Y.  
Maryland Meter Works, Baltimore, Md.  
Precision Instrument Co., 21 Halsey St., Newark, N. J.

Republic Flow Meters Co., 565 Washington Blvd., Chicago, Ill.

Steele Engineering Co., Detroit, Mich.  
Superior Meter Co., Bush Terminal, Brooklyn, N. Y.

The Schaeffer & Budenberg Mfg. Co., Brooklyn, N. Y.

Taylor Instrument Companies, Rochester, N. Y.  
The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.

The Western Gas Construction Co., Fort Wayne, Ind.

### INSULATING MATERIALS

Armstrong Cork Company, Pittsburgh, Pa.  
Celite Products Co., 11 Broadway, New York, N. Y.

Davis & Farnum Mfg. Co., Waltham, Mass.  
Johns-Manville Inc., Madison Ave. and 41st St., New York, N. Y.

Quigley Furnace Specialties Co., 26 Cortlandt St., New York, N. Y.

### KILNS (For Firing Glass, China and Pottery)

B. F. Drakenfeld & Co., Inc., 50 Murray St., New York, N. Y.  
General Gas Appliance Co., 103 Park Ave., New York, N. Y.

Russell Engineering Co., St. Louis, Mo.

### KILNS

The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.

The Parker-Russell Mining & Mfg. Co., St. Louis, Mo.

The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.

### LABORATORY (Flash and Fire Test Apparatus)

Taylor Instrument Companies, Rochester, N. Y.

### LIGHTERS (Ranges)

Class Automatic Gas Cook Co., Milwaukee, Wis.  
Will W. Barnes, Tucson, Ariz.

The Michigan Stove Co., Detroit, Mich.  
Milwaukee Gas Specialty Co., Milwaukee, Wis.

J. M. Sherwood Co., New York, N. Y.  
Geo. D. Roper Corp., Rockford, Ill.

Strause Gas Iron Co., Philadelphia, Pa.  
Weisbach Co., Gloucester, N. J.

### LIGHTING (Fixtures)

Will W. Barnes, Tucson, Ariz.  
Salem Brothers, 122 Centre St., New York, N. Y.

Weisbach Co., Gloucester, N. J.

### LIGHTING (Gas Domes, Portables, etc.)

Will W. Barnes, Tucson, Ariz.  
Kramer Bros. Lamp Co., 585 Broadway, New York, N. Y.

Royal Art Glass Co., 243 Canal St., New York, N. Y.

Salem Brothers, 122 Centre St., New York, N. Y.  
Weisbach Co., Gloucester, N. J.

### LIGHTING (Glassware)

Salem Brothers, 122 Centre St., New York, N. Y.  
Weisbach Co., Gloucester, N. J.

### LIGHTING (Incidentals)

Storrs Mica Co., Owego, N. Y.

### LIGHTING (Mantles)

General Gas Light Co., New York, N. Y., and Kalamazoo, Mich.

Lindsay Light Co., New York, N. Y.

Weisbach Co., Gloucester, N. J.

### LUX MATERIAL

Alpha-Lux Co., Inc., 192 Frost St., New York, N. Y.

### METAL RECEPTACLES

American Gas Furnace Co., 24 John St., New York, N. Y.

Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.

Charles A. Hones, Inc., Baldwin, Long Island, N. Y.

The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.

National Machine Works, Sheffield & North Aves., Chicago, Ill.

The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.

United Lead Co., 111 Broadway, New York, N. Y.

### METERS

American Meter Co., Inc., New York, N. Y.  
Bacharach Industrial Instrument Co., Pittsburgh, Pa.

Bailey Meter Co., Cleveland, Ohio  
Cleveland Gas Meter Co., Cleveland, Ohio

Equitable Meter Co., Pittsburgh, Pa.

The Foxboro Co., Inc., Foxboro, Mass.

John J. Griffin & Co., 1521 Race St., Philadelphia, Pa.

Helme & McIlhenny, 17th and Clearfield Sts., Philadelphia, Pa.

Lambert Meter Co., Inc., Bush Terminal Bldg., Brooklyn, N. Y.

D. McDonald & Co., Albany, N. Y.  
Maryland Meter Works, Baltimore, Md.

Metric Metal Works, Erie, Pa.  
Pittsburgh Meter Co., East Pittsburgh, Pa.

Precision Instrument Co., 21 Halsey St., Newark, N. J.

Republic Flow Meters Co., 56 S. Washington Blvd., Chicago, Ill.

Rotary Meter Co., 52 Vanderbilt Ave., New York, N. Y.

Superior Meter Co., Bush Terminal, Brooklyn, N. Y.

Taylor Instrument Companies, Rochester, N. Y.

The Connersville Blower Co., Connersville, Ind.

The Cutler-Hammer Mfg. Co., Milwaukee, Wis.

The Sprague Meter Co., Bridgeport, Conn.

Nathaniel Tufts Meter Works, 453 Commercial St., Boston, Mass.

### METERS (Air and Steam)

Pittsburgh Meter Co., East Pittsburgh, Pa.  
Republic Flow Meters Co., 565 Washington Blvd., Chicago, Ill.

The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.

### METER CONNECTIONS, SEALS, Etc.

American Meter Co., Inc., New York, N. Y.  
Cleveland Gas Meter Co., Cleveland, Ohio

S. R. Dresser Mfg. Co., Bradford, Pa.  
Equitable Meter Co., Pittsburgh, Pa.

Helme & McIlhenny, 17th and Clearfield Sts., Philadelphia, Pa.

D. McDonald & Co., Albany, N. Y.  
H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.

Superior Meter Co., Bush Terminal, Brooklyn, N. Y.

The Lattimer Stevens Co., Columbus, Ohio  
The Sprague Meter Co., Bridgeport, Conn.



## A. G. A. MONTHLY

Nathaniel Tufts Meter Works, 455 Commercial St., Boston, Mass.  
Pittsburgh Meter Co., East Pittsburgh, Pa.

**METERS** (Steam, Condensation, Oil, Hot and Cold Water)  
Pittsburgh Meter Co., Gasoline, East Pittsburgh, Pa.  
Republic Flow Meter Co., 565 Washington Blvd., Chicago, Ill.

### METER PROVERS

American Meter Co., Inc., New York, N. Y.  
Equitable Meter Co., Pittsburgh, Pa.  
John J. Griffin & Co., Philadelphia, Pa.  
Helme & McIlhenny, 17th and Clearfield Sts., Philadelphia, Pa.  
Lambert Meter Co., Inc., Bush Terminal Bldg., Brooklyn, N. Y.  
D. McDonald & Co., Albany, N. Y.  
Maryland Meter Works, Baltimore, Md.  
Pittsburgh Meter Co., East Pittsburgh, Pa.  
Superior Meter Co., Bush Terminal, Brooklyn, N. Y.  
Nathaniel Tufts Meter Works, 455 Commercial St., Boston, Mass.

**METER SEALS & ADJUSTABLE CONNECTIONS**  
The Lattimer-Stevens Co., Columbus, O.

### METER SHELF

Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.  
The Lattimer-Stevens Co., Columbus, O.

### OFFICE LABOR SAVING DEVICES

Addressograph Co., Chicago, Ill.  
Elliott-Fisher Co., Harrisburg, Pa.  
Kalamazoo Loose-Leaf Binder Co., Kalamazoo, Mich.  
Library Bureau, Boston, Mass.  
Remington Typewriter Co., 374 Broadway, New York, N. Y.  
Underwood Typewriter Co., Vesey St., New York, N. Y.

### OIL (Diaphragm)

John J. Griffin & Co., 1521 Race St., Philadelphia, Pa.  
Superior Meter Co., Brooklyn, N. Y.

### OVENS (Baking and Cooking)

Geo. M. Clark & Co. Div., Chicago, Ill.  
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.  
Eclipse Gas Stove Co., Rockford, Ill.  
Famous Oven Manufacturing Co., 110 W. 42nd St., New York, N. Y.  
General Gas Appliance Co., 103 Park Ave., New York, N. Y.  
Grinnell Co., Inc., Providence, R. I.  
Meek Oven Mfg. Co., 18 W. 34th St., New York, N. Y.  
The G. S. Blodgett Co., Burlington, Vt.  
The Crandall-Petee Co., Hudson St., New York, N. Y.  
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.  
The Ohio State Stove & Mfg. Co., Columbus, Ohio.  
The Union Steel Products Co., Ltd., Albion, Mich.  
E. E. Steiner & Co., Inc., 20 Orange St., Newark, N. J.  
The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.

### OVENS (Annealing, Japanning, Drying, Core, etc.)

Famous Oven Manufacturing Co., 110 W. 42nd St., New York, N. Y.  
Gehrich Indirect Heat Oven Co., Inc., 62 Franklin Ave., Brooklyn, N. Y.  
General Gas Appliance Co., 103 Park Ave., New York, N. Y.  
Grinnell Co., Inc., Providence, R. I.  
Johnson Gas Appliance Co., Cedar Rapids, Iowa.  
Meek Oven Mfg. Co., 18 W. 34th St., New York, N. Y.

National Machine Works, Sheffield & North Aves., Chicago, Ill.  
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.  
The C. M. Kemp Mfg. Co., Baltimore, Md.  
Monarch Engineering & Mfg. Co., American Bldg., Baltimore, Md.  
E. E. Steiner & Co., Inc., 20 Orange St., Newark, N. J.  
The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.  
The Union Steel Products Co., Ltd., Albion, Mich.  
Young Bros. Co., Detroit, Mich.

### OVENS (Warming)

Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.  
Eclipse Gas Stove Co., Rockford, Ill.  
General Gas Appliance Co., 103 Park Ave., New York, N. Y.  
Meek Oven Mfg. Co., 18 W. 34th St., New York, N. Y.  
The G. S. Blodgett Co., Burlington, Vt.  
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.  
The Union Steel Products Co., Ltd., Albion, Mich.

**PACKINGS** (Rods, Plunger, Piston and Flange)  
Johns-Manville Inc., Madison Ave. and 41st St., New York, N. Y.

### PHOTOMETERS

American Meter Co., Inc., New York, N. Y.  
Connelly Iron Sponge & Governor Co., 227 Fulton St., New York, N. Y.  
D. McDonald & Co., Albany, N. Y.  
Maryland Meter Works, Baltimore, Md.  
Nathaniel Tufts Meter Works, Boston, Mass.

### PIPE

Davis & Farnum Mfg. Co., Waltham, Mass.  
Grinnell Co., Inc., Providence, R. I.  
National Tube Co., Frick Bldg., Pittsburgh, Pa.  
Ritter-Conley Co., Pittsburgh, Pa.  
Steele Engineering Co., Detroit, Mich.  
The Bartlett Hayward Co., Baltimore, Md.  
United Lead Co., 111 Broadway, New York, N. Y.

### PIPE CASTINGS AND SPECIALS

Banner Iron Works, 4560 Shaw Ave., St. Louis, Mo.  
Davis & Farnum Mfg. Co., Waltham, Mass.  
National Machine Works, Sheffield & North Aves., Chicago, Ill.  
Isbell-Porter Co., Newark, N. J.  
Gas Engineering Co., Ingram Ave., Newark, N. J.  
The Bartlett Hayward Co., Baltimore, Md.  
The Stacey Manufacturing Co., Cincinnati, Ohio.  
The Western Gas Construction Co., Fort Wayne, Ind.

### PIPE CLAMPS AND SLEEVES

Davis & Farnum Mfg. Co., Waltham, Mass.  
S. R. Dresser Mfg. Co., Bradford, Pa.  
National Machine Works, Sheffield & North Aves., Chicago, Ill.

### PIPE PACKING

Celite Products Co., 11 Broadway, New York, N. Y.  
Grinnell Co., Inc., Providence, R. I.  
United Lead Co., 111 Broadway, New York, N. Y.

### PIPE TOOLS (Caulking, Cutting, Tapping)

Grinnell Co., Inc., Providence, R. I.  
H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.  
Safety Gas Main Stopper Co., 943 Fulton St., Brooklyn, N. Y.  
United Lead Co., 111 Broadway, New York, N. Y.



## A. G. A. MONTHLY

### PLATE WARMERS

Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.  
 Duparquet, Huot & Moneuse Co., 108 W. 32nd St., New York, N. Y.  
 General Gas Appliance Co., 103 Park Ave., New York, N. Y.  
 The Improved Appliance Co., 419 Kent Ave. Brooklyn, N. Y.  
 Geo. D. Roper Corp., Rockford, Ill.

### PORCELAIN ENAMEL PARTS (Stoves, Lamps, Linings, Stamping and Spinnings)

Baltimore Enamel & Novelty Co., Baltimore, Md.  
 Chicago Vitreous Enamel Product Co., 1407 So. 55th Court, Cicero, Ill.  
 Eclipse Gas Stove Co., Rockford, Ill.

The Enamel Products Co., Cleveland, Ohio  
 The Porcelain Enamel & Mfg. Co., Baltimore, Md.  
 The Union Steel Products Co., Ltd., Albion, Mich.

### PORCELAIN ENAMEL PLANTS (Installers)

The Porcelain Enamel & Mfg. Co., Baltimore, Md.

### PRESSURE GAUGES

American Meter Co., Inc., New York, N. Y.  
 Bacharach Industrial Instrument Co., Pittsburgh, Pa.

Connelly Iron Sponge & Governor Co., 227 Fulton St., New York, N. Y.

Equitable Meter Co., Pittsburgh, Pa.

Grinnell Co., Inc., Providence, R. I.

Maryland Meter Works, Baltimore, Md.

D. McDonald Co., Albany, N. Y.

National Machine Works, Sheffield & North Aves., Chicago, Ill.

Superior Meter Co., Bush Terminal, Brooklyn, N. Y.

The Bryant Heater & Mfg. Co., Cleveland, Ohio  
 The Gas Machinery Co., Cleveland, Ohio

The Schaeffer & Budenberg Mfg. Co., Brooklyn, N. Y.

Taylor Instrument Cos., Rochester, N. Y.  
 The Western Gas Construction Co., Fort Wayne, Ind.

Nathaniel Tufts Meter Works, Boston, Mass.

### PRESSURE GAUGES (Boiler, Naphtha, Oil, Steam, Tar)

M. T. Davidson Co., 154 Nassau St., New York, N. Y.

### PYROMETERS (Indicating and Recording)

Taylor Instrument Cos., Rochester, N. Y.

### PUMPS

The Connorsville Blower Co., Connorsville, Ind.  
 M. T. Davidson Co., 154 Nassau St., New York, N. Y.

Gas Machinery Co., Cleveland, Ohio

Nathaniel Tufts Meter Works, Boston, Mass.

The P. H. & F. M. Roots Co., Connorsville, Ind.

Superior Meter Co., Brooklyn, N. Y.

Geo. D. Roper Corp., Rockford, Ill.

The Western Gas Construction Co., Fort Wayne, Ind.

L. J. Wing Mfg. Co., 362 West 13th St., New York, N. Y.

### PURIFIERS

Connelly Iron Sponge & Governor Co., 227 Fulton St., New York, N. Y.

Cruise-Kemper Co., Ambler, Pa.

Davis & Farnum Mfg. Co., Waltham, Mass.

Gas Engineering Co., Ingram Ave., Newark, N. J.

Gas Machinery Co., Cleveland, Ohio

Isbell-Porter Co., Newark, N. J.

Ritter-Conley Co., Pittsburgh, Pa.

Steere Engineering Co., Detroit, Mich.

The Bartlett Hayward Co., Baltimore, Md.

The Improved Equipment Co., 60 Wall St., New York, N. Y.

The Stacey Bros. Gas Construction Co., Cincinnati, Ohio

The Stacey Manufacturing Co., Cincinnati, Ohio

The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.

The Western Gas Construction Co., Fort Wayne, Ind.

### PURIFYING MATERIALS

Alpha-Lux Co., Inc., 192 Front St., New York, N. Y.

Connelly Iron Sponge & Governor Co., 227 Fulton St., New York, N. Y.

Eph Lyon, Trust Company Bldg., Franklin, Pa.

Gas Purifying Materials Co., Long Island City, N. Y.

J. F. Henderson Co., 1707 Commonwealth Bldg., Pittsburgh, Pa.

Iron Hydroxide Co., Paschall Station, Philadelphia, Pa.

Iron Oxide Products, Inc., 1301 S. 55th Court, Cicero, Ill.

### RADIANT HEATERS

General Gas Light Co., New York—Kalamazoo, J. H. Grayson Mfg. Co., Athens, Ohio.

Kennedy-Toombs, Inc., 126 Eleventh Ave., New York, N. Y.

Welsbach Company, Gloucester, N. J.

Roberts and Mander Stove Co., Philadelphia, Pa.

### RADIATORS

American Gas Appliance Co., 108 Lawrence St., Brooklyn, N. Y.

Buffalo Gas Steam Radiator Co., Gowanda, N. Y.

James B. Clow & Sons, Chicago, Ill.

Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.

Eriez Stove & Mfg. Co., Erie, Pa.

Grinnell Co., Inc., Providence, R. I.

Hugo Manufacturing Co., West Duluth, Minn.

Kidde & Co., 103 Park Ave., New York, N. Y.

J. B. Slatery & Bro., Inc., 108-110 Lawrence St., Brooklyn, N. Y.

The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.

The A. H. Wolff Gas Radiator Co., 4 Great Jones St., New York, N. Y.

### RANGES (Domestic)

A-B Stove Co., Battle Creek, Mich.

American Range & Foundry Co., Minneapolis, Minn.

American Stove Co., St. Louis, Mo.

Century Stove & Mfg. Co., Johnstown, Pa.

Geo. M. Clark & Co. Div., Chicago, Ill.

Chambers Manufacturing Co., Shelbyville, Ind.—(Fireless type)

The Bartlett Co., Inc., Philadelphia, Pa.

Comstock-Castle Stove Co., Quincy, Ill.

Abram Cox Stove Co., Philadelphia, Pa.

Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.

Detroit Stove Works, Detroit, Mich.

Dangler Stove Co. Div., Cleveland, Ohio

Eclipse Gas Stove Co. Div., Rockford, Ill.

Eriez Stove & Mfg. Co., Erie, Pa.

Estate Stove Co., Hamilton, Ohio

Cribben & Sexton Co., Chicago, Ill.

Malleable Iron Range Co., Beaver Dam, Wis.

National Stove Co. Div., Lorain, Ohio

New Process Stove Co. Div., Cleveland, Ohio

Quick Meal Stove Co. Div., St. Louis, Mo.

Rathbone, Sard & Co., Albany, N. Y.

Reliable Stove Co. Div., Cleveland, Ohio

Roberts & Mander Stove Co., Philadelphia, Pa.

Scott Gas Appliance Mfg. Co., Commercial House, Pottstown, Pa.

J. M. Sherwood Co., New York, N. Y.

The Baltimore Gas Appliance & Mfg. Co., Baltimore, Md.

The Champion Stove Co., Cleveland, Ohio

The Eclipse Stove Co., Mansfield, Ohio

The General Gas Appliance Co., 103 Park Ave., New York, N. Y.

The Michigan Stove Co., Detroit, Mich.

The Ohio State Stove & Mfg. Co., Columbus, Ohio

The Trenkamp Stove & Mfg. Co., Cleveland, O.

The Peninsular Stove Co., Detroit, Mich.

The A. H. Wolff Gas Radiator Co., 4 Great Jones St., New York, N. Y.

## A. G. A. MONTHLY

Union Stove Works, 70 Beckman St., New York, N. Y.  
 Vesta Gas Range & Mfg. Co., Chattanooga, Tenn.  
 Walker & Pratt Mfg. Co., Boston, Mass.  
 Weir Stove Co., Taunton, Mass.  
 Wheeling Corrugating Co., Wheeling, W. Va.

### RANGES (Hotel)

American Stove Co., St. Louis, Mo.  
 Geo. M. Clark & Co. Div., Chicago, Ill.  
 Comstock-Castle Stove Co., Quincy, Ill.  
 Abram Cox Stove Co., Philadelphia, Pa.  
 Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.  
 Detroit Stove Works, Detroit, Mich.  
 Duparquet, Huot & Moneuse Co., 108 W. 32nd St., New York, N. Y.  
 Eclipse Gas Stove Co. Div., Rockford, Ill.  
 Estate Stove Co., Hamilton, Ohio  
 The General Gas Appliance Co., 103 Park Ave., New York, N. Y.  
 Roberts & Mander Stove Co., Philadelphia, Pa.  
 The Baltimore Gas Appliance & Mfg. Co., Baltimore, Md.  
 The Michigan Stove Co., Detroit, Mich.

### REFRACTORY MATERIALS

J. H. Gautier & Co., Jersey City, N. J.  
 Harbison-Walker Refractories Co., Pittsburgh, Pa.  
 Johns-Manville Inc., New York, N. Y.  
 Quigley Furnace Specialties Co., 26 Cortlandt St., New York, N. Y.  
 Mount Union Refractories Co., Mount Union, Pa.  
 Ritter-Conley Co., Pittsburgh, Pa.  
 Russell Engineering Co., St. Louis, Mo.  
 G. F. Schmidt, Chicago, Ill.  
 Tate-Jones & Co., Inc., 30 Church St., New York, N. Y.  
 The Improved Equipment Co., 60 Wall St., New York, N. Y.  
 Monarch Engineering & Mfg. Co., American Bldg., Baltimore, Md.  
 The Parker-Russell Mining & Mfg. Co., St. Louis, Mo.

### REGULATORS (Governors)

The Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.  
 Broadway, New York, N. Y.  
 Connelly Iron Sponge & Governor Co., 227 Fulton St., New York, N. Y.  
 Equitable Meter Co., Pittsburgh, Pa.  
 Gas Machinery Co., Cleveland, Ohio  
 Isbell-Porter Co., Newark, N. J.  
 H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.  
 National Machine Works, Sheffield & North Aves., Chicago, Ill.  
 Reynolds Gas Regulator Co., Anderson, Ind.  
 Steere Engineering Co., Detroit, Mich.  
 The Connersville Blower Co., Connersville, Ind.  
 The Improved Equipment Co., 60 Wall St., New York, N. Y.  
 The Sprague Meter Co., Bridgeport, Conn.  
 The Western Gas Construction Co., Fort Wayne, Ind.  
 L. J. Wing Mfg. Co., 362 West 13th St., New York, N. Y.

### REPAIRS (Gas Meters and Appliances)

Helme & McIlhenny, 17th and Clearfield Sts., Philadelphia, Pa.  
 Maryland Meter Works, Baltimore, Md.  
 Superior Meter Co., Brooklyn, N. Y.  
 The Western Gas Construction Co., Fort Wayne, Ind.

### RETORTS

Gas Machinery Co., Cleveland, Ohio  
 J. H. Gautier & Co., Jersey City, N. J.  
 Harbison-Walker Refractories Co., Pittsburgh, Pa.  
 Russell Engineering Co., St. Louis, Mo.  
 Ritter-Conley Co., Pittsburgh, Pa.  
 The Improved Equipment Co., 60 Wall St., New York, N. Y.  
 The Parker-Russell Mining & Mfg. Co., St. Louis, Mo.

The West Gas Improvement Co. of America, 150 Nassau St., New York, N. Y.

### ROOFING

Johns-Manville Inc., New York, N. Y.

### ROOF CEMENTS

John-Manville Inc., New York, N. Y.

### RUST PREVENTIVE

Superior Laboratories, Grand Rapids, Mich.

### SCRUBBERS

Davis & Farnum Mfg. Co., Waltham, Mass.  
 Gas Engineering Co., Ingram Ave., Trenton, N. J.  
 Foundation Oven Corporation, Woolworth Building, New York, N. Y.  
 Gas Machinery Co., Cleveland, Ohio  
 Isbell-Porter Co., Newark, N. J.  
 Ritter-Conley Co., Pittsburgh, Pa.  
 Steere Engineering Co., Detroit, Mich.  
 The Bartlett Hayward Co., Baltimore, Md.  
 The Improved Equipment Co., 60 Wall St., New York, N. Y.  
 The Koppers Co., Pittsburgh, Pa.  
 The Stacey Bros. Gas Construction Co., Cincinnati, Ohio  
 The Stacey Manufacturing Co., Cincinnati, Ohio  
 The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.  
 The Western Gas Construction Co., Fort Wayne, Ind.

### SELLING AGENTS

J. M. Sherwood Co., 154 Chambers St., New York, N. Y.  
 Kidde & Co., 103 Park Ave., New York, N. Y.  
 Will W. Barnes, Tucson, Ariz.

### SERVICE BOXES, CLAMPS, Etc.

Davis & Farnum Mfg. Co., Waltham, Mass.  
 Grinnell Co., Inc., Providence, R. I.  
 Hays Mfg. Co., Inc., Erie, Pa.  
 H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.

### SERVICE VALVES (Gate Valves)

The Ludlow Valve Mfg. Co., Ft. Adams St., Troy, N. Y.

### SPECIALS—CAST IRON

The Western Gas Construction Co., Fort Wayne, Ind.

### STEAM TRAPS

John-Manville Inc., New York, N. Y.

### STILLS (Benzol, Toluol)

Foundation Oven Corporation, Woolworth Building, New York, N. Y.  
 The Bartlett Hayward Co., Baltimore, Md.  
 The Koppers Co., Pittsburgh, Pa.  
 The Western Gas Construction Co., Fort Wayne, Ind.

### STOPPERS (Gas main)

Safety Gas Main Stopper Co., 943 Fulton St., Brooklyn, N. Y.

### STOVES (Confectioners, Laundry, Tailor)

A-B Stove Co., Battle Creek, Mich.  
 American Stove Co., St. Louis, Mo.  
 Geo. M. Clark & Co. Div., Chicago, Ill.  
 Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.  
 The General Gas Appliance Co., 103 Park Ave., Brooklyn, N. Y.  
 The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.  
 Geo. D. Roper Corp., Rockford, Ill.

## A. G. A. MONTHLY

### STRUCTURAL STEEL WORKS (See Holders)

#### TANKS (Ammonia, Oil, Water)

Cruse-Kemper Co., Ambler, Pa.  
 Davis & Farnum Mfg. Co., Waltham, Mass.  
 Gas Engineering Co., Ingram Ave., Trenton, N. J.  
 Gas Machinery Co., Cleveland, Ohio  
 National Tube Co., Frick Bldg., Pittsburgh, Pa.  
 Ritter-Conley Co., Pittsburgh, Pa.  
 Steere Engineering Co., Detroit, Mich.  
 The Bartlett Hayward Co., Baltimore, Md.  
 The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.  
 The Stacey Bros. Gas Construction Co., Cincinnati, Ohio  
 The Stacey Manufacturing Co., Cincinnati, Ohio  
 The Western Gas Construction Co., Fort Wayne, Ind.

#### TAR DEHYDRATION

Metcalf-Shaw Corp., 1304 Flatbush Ave., Brooklyn, N. Y.  
 The Sharples Specialty Co., New York, N. Y.

#### THERMOMETERS

Connelly Iron Sponge & Governor Co., 227 Fulton St., New York, N. Y.  
 Gas Machinery Co., Cleveland, Ohio  
 Grinnell Co., Inc., Providence, R. I.  
 Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.  
 Gas Engineering Co., Ingram Ave., Trenton, N. J.  
 Superior Meter Co., Bush Terminal, Brooklyn, N. Y.  
 Taylor Instrument Co., Rochester, N. Y.  
 The Schaeffer & Budenberg Mfg. Co., Brooklyn, N. Y.  
 The Western Gas Construction Co., Fort Wayne, Ind.

#### THERMOSTATS

Claus Automatic Gas Cock Co., Milwaukee, Wis.  
 Gas Machinery Co., Cleveland, Ohio  
 Kidde & Co., 103 Park Ave., New York, N. Y.  
 Minneapolis Heat Regulator Co., Minneapolis, Minn.  
 B. Ryan & Co., 372 W. 15th St., New York, N. Y.  
 The Bryant Heater & Mfg. Co., Cleveland, Ohio  
 Van Zandt Gas Appliance Co., 4050 Olive St., St. Louis, Mo.  
 The H. A. Wilson Co., 97 Chestnut St., Newark, N. J.

#### THERMO VALVES

Claus Automatic Gas Cock Co., Milwaukee, Wis.  
 Pittsburgh Water Heater Co., Pittsburgh, Pa.  
 Robertshaw Mfg. Co., Youngwood, Pa.

#### THORIUM

Welsbach Co., Gloucester, N. J.

#### TRENCH WORK

Connelly Iron Sponge & Governor Co., 227 Fulton St., New York, N. Y.  
 Safety Gas Main Stopper Co., 943 Fulton St., Brooklyn, N. Y.

#### TURBINE (Steam)

L. J. Wing Mfg. Co., 362 West 13th St., New York, N. Y.

#### VALVES

Claus Automatic Gas Cock Co., Milwaukee, Wis.  
 Connelly Iron Sponge & Governor Co., 227 Fulton St., New York, N. Y.  
 Gas Machinery Co., Cleveland, Ohio  
 Grinnell Co., Inc., Providence, R. I.  
 Isbell-Porter Co., Newark, N. J.  
 Steere Engineering Co., Detroit, Mich.

The Bartlett Hayward Co., Baltimore, Md.  
 The Bryant Heater & Mfg. Co., Cleveland, Ohio  
 The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.

The Improved Equipment Co., 60 Wall St., New York, N. Y.

The Ludlow Valve Mfg. Co., Ft. Adams St., Troy, N. Y.

The Stacey Manufacturing Co., Cincinnati, Ohio  
 The Western Gas Construction Co., Fort Wayne, Ind.

#### VALVES (Needle Valves for Gas Stoves)

Acme Brass Works, Detroit, Mich.  
 Claus Automatic Gas Cock Co., Milwaukee, Wis.  
 Peninsular Brass Works, Detroit, Mich.  
 The McRae & Roberts Co., Detroit, Mich.  
 The Roberts Brass Mfg. Co., Detroit, Mich.

#### WASHING MACHINES

Detroit Washing Machine Corp., Detroit, Mich.  
 The "1900" Washer Co., Inc., Binghamton, N. Y.

#### WATER HEATERS

A-B Stove Co., Battle Creek, Mich.  
 American Heater Corporation, St. Louis, Mo.  
 Bartlett & Co., Inc., Philadelphia, Pa.  
 Bastin Morley Co., La Porte, Ind.  
 Geo. M. Clark & Co. Div., Chicago, Ill.  
 The Cleveland Heater Co., Cleveland, Ohio  
 Abram Cox Stove Co., Philadelphia, Pa.  
 Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.  
 Detroit Stove Works, Detroit, Mich.  
 Eclipse Gas Stove Co., Rockford, Ill.  
 The Elliott Water Heating Co., Brooklyn, N. Y.  
 Estate Stove Co., Hamilton, Ohio  
 General Gas Appliance Co., 103 Park Ave., New York, N. Y.  
 Humphrey Co. Div., Kalamazoo, Mich.  
 Kidde & Co., 169 Chambers St., New York, N. Y.  
 Lawson Mfg. Co., Pittsburgh, Pa.  
 The Kompak Company, New Brunswick, N. J.  
 New Process Stove Co. Div., Cleveland, Ohio.  
 Peninsular Stove Co., Detroit, Mich.  
 Philadelphia Stove Co., Philadelphia, Pa.  
 Pittsburgh Water Heater Co., Pittsburgh, Pa.  
 B. Ryan & Co., New York, N. Y.  
 The Trenkamp Stove & Mfg. Co., Cleveland, O.  
 The Sands Mfg. Co., Cleveland, Ohio  
 Rathbone, Sard & Co., Albany, N. Y.  
 Reliable Stove Co. Div., Cleveland, Ohio  
 Ruud Mfg. Co., Pittsburgh, Pa.  
 The Baltimore Gas Appliance & Mfg. Co., Baltimore, Md.  
 The Bryant Heater & Mfg. Co., Cleveland, Ohio  
 The Hoffman Heater Co., Lorain, Ohio  
 The Lovkin Water Heater Co., 39 Laurel St., Philadelphia, Pa.  
 The Michigan Stove Co., Detroit, Mich.  
 Van Zandt Gas Appliance Co., 4050 Olive St., St. Louis, Mo.  
 The Wales Co., Kalamazoo, Mich.

#### WATER SOFTENERS

The Refinite Co., Inc., Omaha, Neb.

#### WATER STILLS (Gas Heated)

The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.  
 Young Bros. Co., Detroit, Mich.

#### WELDED STEEL PIPE

The Bartlett Hayward Co., Baltimore, Md.  
 The Western Gas Construction Co., Fort Wayne, Ind.  
 Steere Engineering Co., Detroit, Mich.







# Employment Bureau

## SERVICES OFFERED

**WANTED**—Position as Industrial Power and Fuel Engineer. Technical engineer and salesman of excellent qualifications for industrial power and fuel sales. Now employed \$3000. Address—A. G. A.

Key No. 111

**WANTED**—Position as executive in a local office of a gas or a combination gas and electric company. Have had practical experience in all branches of commercial utility work. Have been successful in dealing with the public and promoting good will of utility companies. Educated in commercial and accounting methods as compiled by the N. C. G. A. and N. E. L. A. Well acquainted in office routine and very exact on details and execution of same. Address A. G. A.

Key No. 114

**WANTED**—A position with a gas appliance company having need for an all around man experienced in development and selling. Can furnish best of references. Address—A. G. A.

Key No. 116

**POSITION WANTED**—As General Superintendent or Engineer of good-sized company, by well known technical graduate of 15 years connection with the gas business. Experienced in every branch of the industry and has made good. Has been superintendent of one large company and manager of other smaller ones. Has himself laid mains, made gas, set ranges, purchased and sold appliances, etc., so that he knows the difficulties and the things to avoid. Noted for his ability to handle men. Well read and up-to-date in every particular. Address—A. G. A.

Key No. 117

**WANTED**—Position as manager in medium size town or as gas engineer by technical man with 9 years experience in all branches. Both syndicate and private operation. Has shown exceptionally good results. Address A. G. A.

Key No. 118

**WANTED**—Position as manager or superintendent with gas company in North Eastern States. Eight years experience in both coal and water gas. Married. Good references. Address A. G. A.

Key No. 119

**WANTED**—Position as General Manager of Gas or Gas and Electric Company in city of size or as assistant to chief executive in very large company. Operation, management, finance, rates and capitalization by Public Utility engineer of my broad experience. Address A. G. A.

Key No. 120

**WANTED**—Position as assistant to engineer of small syndicate of gas and electric companies. Have had four years experience in engineering department of a holding corporation. Address A. G. A.

Key No. 121

**WANTED**—Position where nearly twenty years intensive study of carbonization, works operation, by-product recovery, and all details of apparatus and machinery peculiar to the manufacturing end of the business can be utilized to mutual advantage. Address A. G. A.

Key No. 122

**WANTED**—Position as Manager of a gas property, by a man who left such a position two months ago to become the Manager of a manufacturing company. Is 34 years of age; technical graduate, and experienced in all branches of the gas business. Reports and data available from past experience; also the best of reference. Address A. G. A.

Key No. 123

**EXECUTIVE AVAILABLE**—An executive who has had some years experience in construction, operation and management of gas, electric power and traction properties will soon be open for engagement. Is specially competent in management of such properties in all branches including fare, rate, franchise, and valuation proceedings, labor matters and public relation. Will show record of successful work for fifteen years back with proofs to anyone interested. Address A. G. A.

Key No. 124

**GAS APPLIANCE SALESMAN**—Especially trained in water and house heating; 15 years' experience; desires selling position, either road or local, with aggressive appliance manufacturer or gas company. Will furnish best selling reference. Drawing account against commission. Address A. G. A.

Key No. 125

**WANTED**—Position as salesman or sales manager with reliable gas or electric appliance manufacturer preferred. Address A. G. A.

Key No. 126

**WANTED**—Position as Superintendent of small company, in town of about 100,000 population or as Assistant Superintendent of some large holding company. New England or Central States preferred. Married, middle age, at present employed and can furnish good reference. Address A. G. A.

Key No. 128

**WANTED**—Position as General Superintendent or Superintendent of Manufacture, coal or water gas; life experience in same, at present superintendent of small plant; Ar references. Salary \$200 per month. Address A. G. A.

Key No. 129

**WANTED**—Position as Manager of property in city of 20,000-25,000. Thorough knowledge of all departments, gained from twenty years' experience. At present employed, but desirous of change. Ample references furnished as to character and ability. Address A. G. A.

Key No. 130

**Wanted**—Position as Superintendent or Assistant Superintendent in medium sized W. G. Plant in vicinity of New York, by American, 26 years of age. Technical education—5 years in Gas Business. At present Superintendent of plant in Western City. Change desired for betterment and desire to return to East. Address A. G. A.

Key No. 133

**Wanted**—Position by a man of large general experience in gas business who has made a special study of sales promotion problems, and who would prove valuable as an assistant to a busy executive in any department. Address A. G. A.

Key No. 134

[Continued from page 621]

Before-the-war methods of financing are changing to meet present conditions. We all know that our merchandising methods will stand a lot of improvement, and maybe these suggestions will bring some of that change about.

A small customer that buys regularly is better than a big one who buys any old time and in uncertain quantities, and

it does seem that we ought to remove this barrier of the selling game from all companies, and bring them into regular and active step with bigger things.

"Pay-As-You-Sell" as a reciprocal policy will do much to bring us back to the good old days of intensive gas appliance merchandising. It would pay to give the matter some thought and trial.

# AMERICAN GAS ASSOCIATION, INC.

HEADQUARTERS 180 EAST 15TH ST., NEW YORK, N. Y.

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